Vol. 1076 Number 2

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

March 10, 1987

U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

March 10, 1987 Volume 1076 Number 2

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed as of Nov. 1, 1986 and was announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

International PCT fees were changed due to differences in the exchange rate effective Nov. 1, 1986 and were announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	420.00
—Corresponding prior U.S. national application filed:	250.00
European Patent Office as Searching Authority	
All cases:	1015.00
International fees	
Basic fee (first 30 pages):	430.00
Basic Supplemental fee (for each page over 30):	8.00
Designation fee for the first 10 national or regional offices:	105.00
Designation fee for 11th and subsequent designations:	No charge

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Sept. 30, 1986.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Mar. 6, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,434,511 through 4,435,850
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED DECEMBER 21, 1986, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,029	06/683,888	11/12/85
(4,365,046)	(06/223,973)	(12/21/82)
4,364,133	06/292,589	12/21/82
4,364,141	06/270,208	12/21/82
4,364,143	06/224,835	12/21/82
4,364,145	06/224,489	12/21/82
4,364,170	06/224,775	12/21/82
4,364,176	06/233,201	12/21/82
4,364,186	06/229,643	12/21/82
4,364,197	06/239,665	12/21/82
4,364,221	06/279,826	12/21/82
4,364,224	06/221,601	12/21/82
4,364,240	06/261,807	12/21/82
4,364,242	06/227,034	12/21/82
4,364,245	06/224,671	12/21/82
4,364,258	06/278,187	12/21/82
4,364,262	06/247,654	12/21/82
4,364,264	06/221,616	12/21/82
4,364,295	06/239,242	12/21/82
4,364,296	06/236,236	12/21/82
4,364,323	06/226,758	12/21/82
4,364,335	06/256,076	12/21/82
4,364,385	06/243,494	12/21/82
4,364,388	06/255,197	12/21/82
4,364,407	06/237,248	12/21/82
4,364,442	06/236,262	12/21/82
4,364,458	06/312,833	12/21/82
4,364,467	06/220,278	12/21/82
4,364,472	06/257,164	12/21/82
4,364,483	06/282,235	12/21/82
4,364,486	06/282,160	12/21/82
4,364,492	06/236,661	12/21/82
4,364,497	06/233,729	12/21/82
4,364,499	06/256,004	12/21/82
4,364,549	06/226,503	12/21/82
4,364,558	06/249,344	12/21/82
4,364,560	06/317,796	12/21/82
4,364,579	06/283,013	12/21/82
4,364,592	06/245,964	12/21/82
4,364,600	06/278,909	12/21/82
4,364,638	06/236,131	12/21/82
4,364,641	06/215,752	12/21/82
4,364,667	06/231,965	12/21/82
4,364,673	06/227,839	12/21/82
4,364,675	06/246,489	12/21/82
4,364,679	06/235,201	12/21/82
4,364,682	06/311,578	12/21/82
4,364,693	06/218,579	12/21/82
4,364,719	06/297,017	12/21/82
4,364,750	06/232,567	12/21/82
4,364,767	06/286,995	12/21/82
4,364,775	06/275,531	12/21/82
4,364,781	06/235,627	12/21/82
4,364,785	06/239,131	12/21/82
4,364,793	06/297,138	12/21/82
4,364,805	06/261,773	12/21/82
4,364,806	06/261,774	12/21/82
4,364,829	06/279,665	12/21/82
4,364,846	06/248,169	12/21/82
4,364,880	06/228,709	12/21/82
4,364,938	06/234,303	12/21/82
4,364,944	06/323,382	12/21/82
4,364,952	06/268,417	12/21/82
4,364,962	06/276,819	12/21/82
4,364,963	06/303,556	12/21/82
4,364,966	06/253,967	12/21/82
4,364,978	06/281,221	12/21/82
4,365,010	06/230,850	12/21/82
4,365,012	06/222,085	12/21/82
4,365,056	06/301,269	12/21/82
4,365,059	06/289,438	12/21/82
4,365,074	06/340,819	12/21/82
4,365,096	06/277,369	12/21/82
4,365,109	06/318,653	12/21/82
4,365,141	06/222,555	12/21/82
4,365,148	06/270,239	12/21/82
4,365,171	06/219,735	12/21/82
4,365,173	06/256,881	12/21/82
4,365,178	06/271,443	12/21/82
4,365,179	06/313,627	12/21/82
4,365,232	06/246,781	12/21/82
4,365,244	06/247,596	12/21/82
4,365,285	06/245,825	12/21/82
4,365,334	06/232,665	12/21/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,339,568, Re. S.N. 948,035, Filed Dec. 31, 1986, Cl. 528/126, AROMATIC POLYMERS CONTAINING KETONE GROUP, Louis M. Maresca, Owner of Record: *Union Carbide Corp., Danbury, Conn.,* Attorney or Agent: William H. Maridson, Ex. Gp.: 153

4,614,341, Re. S.N. 943,560, Filed Dec. 17, 1986, Cl. 273/73C, TENNIS RACKET FRAME MADE OF METAL OXIDE FIBERS AND CERAMIC PARTICLES, David Fernandez, Owner of Record: *Inventor,* Attorney or Agent: W. Poms, et al., Ex. Gp.: 334

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,680,420, Reexam. No. 90/001,155, Requested: Jan. 28, 1987, Cl. 83/167, CYOGENIC ULTRAMICROTOME APPARATUS, Josef Blum, Owner of Record: *Research & Manufacturing Co., Inc., Tucsón, Ariz.,* Attorney or Agent: E. M. Baranowski, Ex. Gp.: 320, Requester: Owner

3,905,809, Reexam. No. 90/001,157, Requested: Jan. 30, 1987, Cl. 430/578, ALLOY FOR MAKING DUCTILE IRON, Andrew B. Malizio, et al., Owner of Record: *U.S. Pipe & Foundry Co., Birmingham, Ala.,* Attorney or Agent: J. W. Grace, Ex. Gp.: 150, Requester: Owner

3,966,419, Reexam. No. 90/001,160, Requested: Feb. 5, 1987, Cl. 422/180, CATALYTIC CONVERTER HAVING MONOLITH WITH MICA SUPPORT MEANS THEREFOR, Rodger E. Bloomfield, Owner of Record: *General Motors Corp., Detroit, Mich.,* Attorney or Agent: F. M. Ritchie, Ex. Gp.: 130, Requester: Owner

3,994,711, Reexam. No. 90/001,156, Requested: Jan. 20, 1987, Cl. 65/163, GLASS TEMPERING SYSTEM INCLUDING OSCILLATING ROLLER FURNACE, Harold A. McMaster, Owner of Record: *Glasstech, Inc., Perrysburgh, Ohio,* Attorney or Agent: E. L. Brooks, Ex. Gp.: 130, Requester: Becker & Becker, Dayton, Ohio

4,539,131, Reexam. No. 90/001,158, Requested: Jan. 30, 1987, Cl. 252/99, SOLID DETERGENT COMPOSITION CONTAINING SODIUM PERBORATE MONOHYDRATE HAVING SPECIFIED SURFACE AREA, Peter F. Garner-Gray, Owner of Record: *Lever Brothers Co., Edgewater, N.J.,* Attorney or

Agent: J. J. Farrell, Ex. Gp.: 150, Requester: The Proctor & Gamble Co., Cincinnati, Ohio

4,562,977, Reexam. No. 90/001,159, Requested: Jan. 27, 1987, Cl. 242/107.4, EASILY ASSEMBLED SEAT BELT RETRACTOR AND METHOD, William Hollowell, Owner of Record: *American Safety Equipment Corp., Troy, Mich.,* Attorney or Agent: Poms, Smith, et al., Ex. Gp.: 240, Requester: Owner

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Department of the Treasury
United States Customs Service

Application for Recordation of Trade Name: "JOBST INSTITUTE, INC."

Action: Notice of Application for Recordation of Trade Name

Summary: Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "JOBST INSTITUTE, INC." used by the Jobst Institute, Inc., a corporation organized under the laws of the State of Ohio, located at 653 Miami St., Toledo, Ohio 43694.

The application states that the trade name is used in connection with the developing and marketing of medical soft goods for the treatment of vascular and lymphatic system disorders due to surgery, trauma or disease, such as support stockings and elastic pressure covers for the treatment of burns, manufactured in the United States.

Before final action is taken on the application, consideration will be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation of this trade name. Notice of the action taken on the application for recordation of this trade name will be published in the Federal Register.

Date: Comments must be received on or before Mar. 27, 1987.

Address: Written comments should be addressed to the Commissioner of Customs, Attention: Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229.

For Further Information Contact: Beatrice E. Moore, Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202–566–5765).

STEVEN PINTER,
Jan. 16, 1987. *Chief, Entry, Licensing and Restricted Merchandise Branch.*

Department of the Treasury
United States Custom Service

Application for Recordation of Trade Name: "ASPEN LABORATORIES, INC."

Action: Notice of Application for Recordation of Trade Name

Summary: Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "ASPEN LABORATORIES, INC." used by the Aspen Laboratories, Inc., a corporation organized under the laws of the State of Colorado, located at 181 Inverness Dr. West, Englewood, Colo. 80155.

The application states that the trade name is used in connection with the developing and marketing of products for medical electronic equipment, such as electrosurgical electrodes, electric power supply and adapter for power supply to supply electricity to electrosurgical electrodes, manufactured in the United States.

Before final action is taken on the application, consideration will be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation of this trade name. Notice of the action taken on the application for recordation of this trade name will be published in the Federal Register.

Address: Written comments should be addressed to the Commissioner of Customs, Attention: Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229.

For Further Information Contact: Beatrice E. Moore, Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202–566–5765).

STEVEN PINTER,
Jan. 21, 1987. *Chief, Entry, Licensing and Restricted Merchandise Branch.*

Department of the Treasury
United States Customs Service

Application for Recordation of Trade Name: "MEDICAL ENGINEERING CORPORATION"

Action: Notice of Application for Recordation of Trade Name

Summary: Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "MEDICAL ENGINEERING CORPORATION" used by the Medical Engineering Corp., a corporation organized under the laws of the State of Delaware, located at 3037 Mount Pleasant, Racine, Wis. 53401.

The application states that the trade name is used in connection with medical prostheses, catheters, drains and tracheal tubes, manufactured in the United States.

Before final action is taken on the application, consideration will be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation of this trade name. Notice of the action taken on the application for recordation of this trade name will be published in the Federal Register.

Date: Comments must be received on or before Mar. 31, 1987.

Address: Written comments should be addressed to the Commissioner of Customs, Attention: Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229.

For Further Information Contact: Beatrice E. Moore, Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202–566–5765).

STEVEN PINTER,
Jan. 21, 1987. *Chief, Entry, Licensing and Restricted Merchandise Branch.*

Department of the Treasury
United States Customs Service

Application for Recordation of Trade Name: "XOMED, INC."

Action: Notice of Application for Recordation of Trade Name

Summary: Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "XOMED, INC." used by the Xomed, Inc., a corporation organized under the laws of the State of Delaware, located at 6743 Southpoint Dr. North, Jacksonville, Fla. 32216.

The application states that the trade name is used in connection with medical prosthetic supplies and apparatus, such as surgical instruments, x-ray machine drapes, ear drapes, various types of sheeting and gauze primarily

for use in surgical procedures, otology implants, and stapedectomy prostheses, manufactured in the United States.

Before final action is taken on the application, consideration will be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation of this trade name. Notice of the action taken on the application for recordation of this trade name will be published in the Federal Register.

Date: Comments must be received on or before Mar. 27, 1987.

Address: Written comments should be addressed to the Commissioner of Customs, Attention: Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229.

For Further Information Contact: Beatrice E. Moore, Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202–566–5765).

STEVEN I. PINTER,
Jan. 16, 1987. *Chief, Entry, Licensing and Restricted Merchandise Branch.*

Filing of Papers During Unscheduled Closings of the Patent and Trademark Office

When the Patent and Trademark Office is officially closed by Executive Order of the President or by the Office of Personnel Management for an entire day because of some unscheduled event, such as adverse weather conditions, the Patent and Trademark Office will consider that day as a "federal holiday within the District of Columbia" under 35 U.S.C. §21. Any action or fee due that day will be considered as timely for the purposes of, e.g., 35 U.S.C. §§119, 133 and 151, if the action is taken, or fee paid, on the next succeeding business day on which the Patent and Trademark Office is open. When the Patent and Trademark Office is open for business during any part of a business day between 8:30 a.m. and 5:00 p.m., papers are due on that day even though the Office may be officially closed for some period of time during the business day because of an unscheduled event. The procedures of 37 CFR 1.8 or 1.10 may be used, as appropriate, for the filing of papers. On any day the Office is open for at least part of the day, papers may also be deposited up to midnight in any boxes which are provided by the Patent and Trademark Office under 37 CFR 1.6(c).

DONALD W. PETERSON,
Feb. 11, 1987. *Acting Assistant Secretary and Commissioner of Patents and Trademarks.*

Patent and Trademark Office Board of Patent Appeals and Interferences Vacancies

The Board of Patent Appeals and Interferences will be filling a number of Examiner-in-Chief vacancies over the next several months. Positions are available in chemical, electrical, and mechanical technologies. Persons interested in being considered for these vacancies are invited to submit inidividual applications for each of the following vacancy announcements:

PTO–87–A6–chemical technology, PTO–87–A7–electrical technology, and PTO–87–A8–mechanical technology. There is no deadline for submitting applications. However, candidates are urged to apply as soon as possible since applications will be accepted only until the positions are filled.

Excerpts from the vacancy announcements describing the duties of the position, qualification requirements, factors to be used in evaluating candidates, and necessary application materials are listed below.

Duties: Serves as a member of the Board of Patent Appeals and Interferences of the Patent and Trademark Office. As an Examiner-in-Chief, participates in the Board's appellate and administrative responsiblities and exercises independent judgment on all matters before him/her on appeal, subject to administrative and policy direction of the Commissioner, and may be responsible for conducting interlocutory proceedings in interference and for determining questions of priority of invention and patentability between interference parties. Appeals filed in accordance with 35 USC 134 and interferences declared in accordance with 35 USC 135 involve complex legal and technical questions. The Board of Patent Appeals and Interferences has the sole power to:

(1) hear and adjudicate appeals from decisions of the Primary Examiners as to patentability in applications for patents, for reissue of patents, and for reexamination of patents;
(2) to declare and to conduct proceedings in interferences; and
(3) to determine priority of invention.

Final decisions of the Board, if unfavorable to an applicant, or to a party to an interference, may be appealed to the United States court of Appeals for the Federal Circuit or civil action may be taken in accordance with 35 USC 145, or 35 USC 146.

Qualification requirements: In addition to a technical degree, candidates must possess:

(1) A minimum of five years of comprehensive patent experience of which at least two years involved the exercise of independent judgment in a responsible position as typified by the exercise of Full Signatory Authority as a Patent Examiner or by comparable experience in some other position inside or outside the Patent and Trademark Office;
(2) A law degree and membership in good standing of the bar in any state, D.C., Puerto Rico, or any territorial court under the Constitution;
(3) A high degree of demonstrated competence in chemical, electrical, or mechanical technology;
(4) A high degree of demonstrated competence and knowledge of interference law and practice;
(5) Demonstrated ability to determine whether or not tests which are submitted in evidence are technically sufficient to prove the question at hand;
(6) Demonstrated ability to write clearly, and to write logically developed opinions;
(7) Demonstrated ability to use legal and technical background to evaluate testimony of witnesses;
(8) Demonstrated ability to deal effectively with people within and outside the Patent and Trademark Office; and
(9) Comprehensive experience in patent prosecution, examination, or administration which demonstrates a thorough knowledge and application of patent laws and rules of practice.

Factors which will be considered in evaluating qualified candidates: Candidates will be evaluated on the total range of their education, training and experience as well as supervisory appraisals and questionnaire responses.

Interested candidates should submit the following:

(1) Personal Qualifications Statement, SF–171;
(2) Merit Program Interest Statement, CD–261 (PTO employees only);
(3) Current supervisory appraisal on your agency's form or on CD–362 (letters of reference for outside candidates);

(4) Annual narrative performance rating, or equivalent;
(5) Examiner-in-Chief Questionnaires; and
(6) Samples which evidence your writing ability.

Questions concerning this notice and requests for application materials should be directed to Ms. Suzanne Waddill, Office of Personnel, One Crystal Park, Suite 700, Arlington, Va., telephone (703) 557-3631.

Feb. 3, 1987.

DONALD W. PETERSON,
Deputy Assistant Secretary and Deputy Commissioner of Patents and Trademarks.

Reinstatement to Roster of Attorneys and Agents

The following is a list of persons whose names have been previously removed from the Register of Attorneys and Agents pursuant to the provisions of 37 CFR 10.11(b), and are being reinstated in view of the required fee and information they have furnished the Office of Enrollment & Discipline.

Jan. 14, 1987.

CAMERON WEIFFENBACH,
Director, Office of Enrollment and Discipline.

de Gorter, Benjamin, 3 Avenue Vavin, Paris, France 75006
Deppenbrock, Bonnie L., 706 Wage Dr., SW, Leesburg, Va. 22075
Finlayson, Joseph A., Jr., 8410 Indian Head Hwy., Fort Washington, Md. 20744
Flynn, Steven H., Union Carbide Corp., Law Dept., Old Ridgebury Rd., Danbury, Conn. 06817
Milks, William C., III, Townsend & Townsend, 2000 Steuart St. Tower, One Market Plz., San Francisco, Calif. 94105
Piggott, Donald J., P.O. Box 9338, Portland, Oreg. 97207
Tachner, Leonard, 3990 Westerly Pl., Suite 295, Newport Beach, Calif. 92660
Tang, Henry Y. S., Brumbaugh, Graves, Donohue & Raymond, 30 Rockefeller Plz., New York, N.Y. 10112
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Tucker, Laurey D., Hubbard, Thurman, Turner & Tucker, 2100 One Galleria Tower, Dallas, Tex. 75240
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Twomey, Thomas N., Harris Corp., Semiconductor Sector, P.O. Box 883, Melbourne, Fla. 32901
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Uilkema, John K., Limbach, Limbach & Sutton, 2001 Ferry Bldg., San Francisco, Calif. 94111
Uretsky, Jack L., 206 N. Grant, Hinsdale, Ill. 60521
Utecht, Francis A., Fulwider, Patton, Rieber, Lee & Utecht, 11 Golden Shore, Suite 510, Long Beach, Calif. 90802
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Vandenberg, John D., Kenyon & Kenyon, One Broadway, New York, N.Y. 10004
van Loo, William J., Jr., 1727 Bahia Vista St., Sarasota, Fla. 33579
Vargo, Paul M., Dressler, Goldsmith, Shore, Sutker & Milnamow, 1800 Prudential Plz., E. Randolph St., Chicago, Ill. 60601
Vogele, Allan W., TRW, Inc., 1900 Richmond Rd., Cleveland, Ohio 44124
Waite, Frank R., 16 Sorrel Dr., Wilmington, Del. 19803
Walford, Craig W., M. W. Kellogg Co., Three Greenway Plz., Houston, Tex. 77046
Walker, Alfred M., 742 Veterans Memorial Hwy., Hauppauge, N.Y. 11788
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Ward, John P., Kerr-McGee Corp., Kerr-McGee Ctr., Oklahoma City, Okla. 73125
Wasp, Edmund J., Nordson Corp., 555 Jackson St., Amherst, Ohio 44001
Wasserman, Abraham, 440 S. Doheny Dr., Beverly Hills, Calif. 90211
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Weinstein, Louis, Weinstein & Kimmelman, Suite 2410 Two Mellon Bank Ctr., Philadelphia, Pa. 19102
Weisz, Louis J., Oldham, Oldham & Weber Co., L.P.A., 1225 W. Market St., Akron, Ohio 44313
Welch, Ronald D., Allied Corp., 401 N. Bendix Dr., South Bend, Ind. 46620
West, Paul B., Ladas & Parry, 26 W. 61st St., New York, N.Y. 10023
Westerman, William F., Armstrong, Nikaido, Marmelstein & Kobovcik, 1725 K St., N.W., Suite 912, Washington, D.C. 20006
Wheeler, David E., 1308 Cleveland Ave., Canton, Ohio 44703
Wiener, Bernard N., IBM Corp., 2000 Purchase St., Purchase, N.Y. 10577
Williamson, Walter L., Nynex Enterprises, 441 Ninth Ave., New York, N.Y. 10001
Winger, Jon C., O'Donnell, Steutermann & Winger, Suite 612, 200 W. Broadway, Louisville, Ky. 40202
Winick, Steven J., Ademco 165 Eileen Way, Syosset, N.Y. 11791
Wisser, Scott A., Kenyon & Kenyon, One Broadway, New York, N.Y. 10004
Wolfe, Frank A., 909 Fifth Ave., Ford City, Pa. 16226
Wood, Donald L., Krass & Young, 2855 Coolidge, Suite 210, Troy, Mich. 48084
Woolcott, Kenneth J., Hybritech, Inc., P.O. Box 269006, San Diego, Calif. 92126
Wozny, Thomas M., Andrus, Sceales, Starke & Sawall, 735 N. Water St., Milwaukee, Wis. 53202
Wu, Jack H., Foxboro Co., Pat. Dept. 187 (52-1J), 38 Neponset Ave., Foxboro, Mass. 02035
Yablon, Jay R., New York State Legislative Commission on Science & Technology, 99 Washington Ave., Suite 704, Albany, N.Y. 12210
Yablonsky, Rebecca, One University Plz., Hackensack, N.J. 07601
Yarmovsky, Max, 64 Bryant Dr., Livingston, N.J. 07039
Young, Philip, 19 W. 34th St., New York, N.Y. 10001
Youngs, Maynard L., Travenol Laboratories, Inc., One Baxter Pkwy., Deerfield, Ill. 60015
Yungman, Bruce A., Hilliard-Lyons Patent Mgmt., Inc., 545 S. Third St., Louisville, Ky. 40202

Zelenka, Michael J., U.S. Army Communications Electronics Comm., AMSEL-LG-LP, Fort Monmouth, N.J. 07703

Zelson, Steve T., Pennie & Edmonds, 1155 Ave. of the Americas, New York, N.Y. 10036

Zieg, Robert L., Borg-Warner Corp., 200 S. Michigan Ave., Chicago, Ill. 60604

Zlatos, Stephen E., Woodard, Weikart, Emhardt & Naughton, One Indiana Sq., Suite 2600, Indianapolis, Ind. 46204

Zurawsky, Lawrence G., Zurawsky & Keck, Suite 415 Lawyers Bldg., 428 Forbes Ave., Pittsburgh, Pa. 15219

Reinstatement to Roster of Attorneys and Agents

The following is a list of persons whose names have been previously endorsed as being inactive on the Register of Attorneys and Agents pursuant to the provisions of 37 CFR 10.6(d), and are being reinstated in view of information they have furnished the Office of Enrollment & Discipline.

CAMERON WEIFFENBACH,
Jan. 14, 1987. *Director, Office of Enrollment & Discipline.*

Camby, John J., 4405 Burlington Pl., N.W., Washington, D.C. 20016

Wilhite, Billy J., 2520 Rocky Branch Rd., Vienna, Va. 22180

Patents Available for License or Sale

General Electric Co. is prepared to grant non-exclusive licenses under the following patent upon reasonable terms to domestic manufacturers. Applications for license may be addressed to Counsel Patent and Legal Operations, Corporate Research and Development, General Electric Co., P.O. Box 8, Bldg. K-1, Rm. 4A70, Schenectady, N.Y. 12301

4,514,500. CELL GROWTH ON LIQUID-LIQUID INTERFACES.

4,276,484. METHOD AND APPARATUS FOR CONTROLLING CURRENT IN INDUCTIVE LOADS, *C. Riverds*, P.O. Box 4757, Woodbridge, Va. 22194.

4,507,155. CLEANING COMPOSITION AND METHOD, *Robert H. Cheek*, 1042 Buchanan St., NE., Washington, D.C. 20017.

4,580,593. DISK VALVE FOR CORROSIVE FLUIDS, *Gunter Herberholz*, c/o Antoneli, Terry & Wands, 1919 Pennsylvania Ave., NW., Suite 600, Washington, D.C. 20006.

4,628,864. AUTOMATIC WATER POWERED FISH FEEDER, *David C. Smeltzer*, Box 133, Bellvue, Colo. 80512

S.N. 690,886. ROTARY INTERNAL COMBUSTION ENGINE, *Joseph F. Frasca*, 5801 York Rd., Lorain, Ohio 44053.

S.N. 803,169. ROTATING GRIP BRAKE FOR BICYCLES, c/o A. Ray Osburn, Mallinckrodt & Mallinckrodt, Patent Attorneys, 317 First Security Bank Bldg., Ogden, Utah 84401.

PATENT NOTICES

Certificates of Correction for the Week of Mar. 10, 1987

D. 281,081	4,596,253	4,613,360	4,623,123
4,236,979	4,596,766	4,613,363	4,623,424
4,436,519	4,599,486	4,613,716	4,623,657
4,519,232	4,599,714	4,613,800	4,623,899
4,539,121	4,600,024	4,614,087	4,624,354
4,548,084	4,600,816	4,614,809	4,625,452
4,548,470	4,601,346	4,614,814	4,625,633
4,550,025	4,601,910	4,615,787	4,625,680
4,550,186	4,602,808	4,615,865	4,625,804
4,554,559	4,603,153	4,615,965	4,626,001
4,555,467	4,603,182	4,616,148	4,626,279
4,560,267	4,603,818	4,616,638	4,626,290
4,562,271	4,604,153	4,616,900	4,626,295
4,562,398	4,604,274	4,616,923	4,626,377
4,565,835	4,604,371	4,617,165	4,626,382
4,567,236	4,604,731	4,617,296	4,627,022
4,567,257	4,605,021	4,617,412	4,627,040
4,567,287	4,607,511	4,617,922	4,627,675
4,567,622	4,607,941	4,618,224	4,627,739
4,569,585	4,608,378	4,618,314	4,628,183
4,575,541	4,608,666	4,618,719	4,628,299
4,576,729	4,609,235	4,618,720	4,629,045
4,580,389	4,609,518	4,618,877	4,629,270
4,583,892	4,609,604	4,618,941	4,629,687
4,584,252	4,610,003	4,619,062	4,629,832
4,584,673	4,610,051	4,620,097	4,630,535
4,585,036	4,610,185	4,620,653	4,631,084
4,585,273	4,610,737	4,620,888	4,631,229
4,585,699	4,610,822	4,620,905	4,632,462
4,589,700	4,610,865	4,621,047	4,632,475
4,591,553	4,610,943	4,621,505	4,633,246
4,591,620	4,611,377	4,621,647	4,633,718
4,592,774	4,611,710	4,621,929	4,633,964
4,593,027	4,611,918	4,622,001	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

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Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
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	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7609
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Connecticut	New Haven: Science Park Library	(203) 786-5000
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4284
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: The Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF January 17, 1987

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	10-22-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-21-86
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	7-25-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-25-85
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-19-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-26-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	7-03-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	1-11-85
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	2-22-85
DESIGN, GROUP 290—K. L. CAGE, Director	6-15-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	8-29-85
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	4-08-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	5-06-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	6-03-85
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	6-02-86

Expiration of patents: The patents within the range of numbers indicated below expire during January 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,487,470 to 3,492,671, inclusive

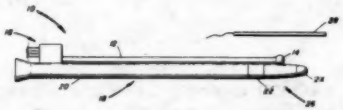
Plant Patents ..... Numbers 2,959 to 2,966 inclusive

REEXAMINATIONS

MARCH 10, 1987

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 Re. 27,757 (638th)
STANDBY DEFIBRILLATOR AND METHOD OF OPERATION
Mieczyslaw Mirowski, Rte. 3, Velvet Valley Way, Owings Mills, Md. 21117
Reexamination Request No. 90/000,918, Dec. 6, 1985.
Reexamination Certificate for Reissue Patent Re. 27,757, issued Sep. 11, 1973, Ser. No. 229,592, Feb. 25, 1972.
Original No. 3,614,955, dated Oct. 26, 1971, Ser. No. 9,935, Feb. 9, 1970.
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 D



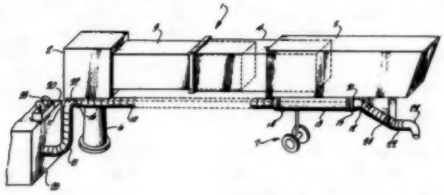
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–3, 5** and **6** is confirmed.

Claim **4** is determined to be patentable as amended.

4. The method of automatically sensing and cardioverting a malfunctioning heart, the method comprising the steps of: continually sensing the function of the heart; discriminating between normal heart function and abnormal heart function; automatically starting a cycle for shocking the heart, in response to the sensing of abnormal-heart function [,]; shocking the heart, *through electrodes, with electrical energy applied directly to the heart* to cause cardioversion; and positively inhibiting the heart shocking cycle under conditions of normal heart function.

B1 3,399,545 (639th)
APPARATUS FOR CONNECTING A STATIONARY AIR CONDITIONING UNIT TO AIRCRAFT
Gordon K. Anderson, Tustin; Richard A. Evans, Newport Beach, and Ralph H. Hilmer, Corona Del Mar, all of Calif., assignors to Lear Siegler, Inc., Santa Monica, Calif.
Reexamination Request No. 90/000,786, May 20, 1985.
Reexamination Certificate for Patent No. 3,399,545, issued Sep. 3, 1968, Ser. No. 640,604, May 23, 1967.
Int. Cl.[4] F25D *15/00*
U.S. Cl. 62—237



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **2–6, 10, 11,** and **13** is confirmed.

Claims **1, 7, 8, 12** and **14** are now disclaimed.

Claim **9** is cancelled.

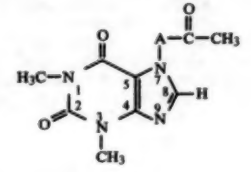
2. The apparatus of claim **1**, in which a supporting cable under tension extends through the interior of the duct along the top surface thereof between the two spaced-apart points.

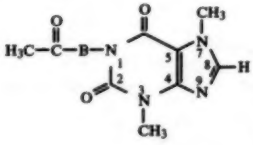
B1 3,737,433 (640th)
CERTAIN OXOALKYLDIMETHYLXANTHINES
Werner Mohler, Hofheim, Taunus; Mario Reiser, and Kurt Popendiker, both of Wiesbaden, all of Fed. Rep. of Germany, assignors to Chemische Werke Albert Aktiengesellschift, Wiesbaden, Fed. Rep. of Germany
Reexamination Request No. 90/000,956, Feb. 11, 1986.
Reexamination Certificate for Patent No. 3,737,433, issued Jun. 5, 1973, Ser. No. 854,032, Aug. 28, 1969.
Continuation of Ser. No. 762,989, Sep. 26, 1968, which is a continuation-in-part of Ser. No. 483,803, Aug. 30, 1965.
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1964, 33811; Sep. 5, 1964, 33812; Jul. 2, 1965, 36289; Jul. 10, 1965, 36362; Jul. 24, 1965, 36493
Int. Cl.[4] C07D *473/04, 473/08*
U.S. Cl. 544—271

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–20** is confirmed.

1. A compound selected from the group consisting of 7-[(ω-1)-oxoalkyl]-1,3-dimethylxanthines and 1-[(ω-1)-oxoalkyl]-3,7-dimethylxanthines of the formulae





respectively, in which A represents an alkylene having from 3 to 6 carbon atoms and B represents an alkylene having from 2 to 5 carbon atoms and in which the keto to which A or B is bound is separated from the xanthine nucleus by at least 2 carbon atoms.

B1 3,835,118 (641st)

SPONGE IRON FRICTION MATERIAL

Seong K. Rhee, Southfield, Mich., and John P. Kwolek, Troy, N.Y., assignors to The Allied Corp.

Reexamination Request Nos. 90/000,898, Nov. 5, 1985 and 90/000,964, Mar. 7, 1986.

Reexamination Certificate for Patent No. 3,835,118, issued Sep. 10, 1974, Ser. No. 360,255, May 14, 1973.

Int. Cl.[4] C08K *3/22*

U.S. Cl. 523—155

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claims **2–7**, dependent on an amended claim, are determined to be patentable.

New claims **8–14** are added and determined to be patentable.

1. A semi-metallic base material for use in a vehicle brake as a friction lining, said material consisting of a mixture of:

metallic powder selected from a group consisting of iron, copper, zinc and mixtures thereof from 0 to 30 percent *by volume* of the total mixture:

sponge iron particles from 10 to 40 percent by volume of the total mixture, said particles having a nominal size which can vary from 20 to 80 mesh;

ceramic powders selected from a group consisting of sillimanite, mullite, magnesium oxide, barium sulfate, aluminum oxide, silica, iron oxide and zirconium oxide from 2 to 15 percent by volume of the total mixture;

rubber particles from 0 to 10 percent by volume of the total mixture;

steel fibers from 0 to 20 percent by volume of the total mixture;

graphite particles from 19 to 39 percent by volume of the total mixture, said graphite particles absorbing thermal energy created during engagement of said friction lining with a corresponding member; and

a phenolic resin binder from 13 to 41 percent by volume of the total mixture, said phenolic resin binder being responsive to heat to form a solid matrix for holding the selected metallic powders, sponge iron particles, ceramic powders, rubber particles and steel fibers in a fixed relationship.

B1 4,180,531 (642nd)

PROCESSIBLE AND VULCANIZABLE POLAR POLYMERS

Dominic Alia, 1609 Sheridan St., Williamsport, Pa. 17701

Reexamination Request No. 90/000,731, Feb. 25, 1985.

Reexamination Certificate for Patent No. 4,180,531, issued Dec. 25, 1979, Ser. No. 742,398, Nov. 16, 1976.

Int. Cl.[4] C08L *23/08, 23/28, 23/34*

U.S. Cl. 525—214

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **12** is cancelled.

Claim **1** is determined to be patentable as amended.

Claims **2–11**, **13** and **14**, dependent on an amended claim, are determined to be patentable.

1. A processible composition consisting essentially of

(i) a saturated polar polymer selected from the group consisting of chlorinated polyethylene, chlorosulfonated polyethylene [or] *and* poly(vinyl chloride);

(ii) at least one ethylene copolymer, solid at 25° C., containing at least 50% by weight of ethylene and up to 50% by weight of [one or more organic compounds which are interpolymerizable with ethylene containing a >C=C< ethylene linkage] *at least one of vinyl acetate and ethyl acrylate, with the proviso that when said ethylene copolymer contains vinyl acetate, the vinyl acetate is present in an amount of at least 8 parts per 100 parts by weight of ethylene,* wherein the ethylene copolymer has a density between 0.92 and 0.96 as per ASTM D-792-60T and a Melt Index of 0.2 to 200 g/10 min. as per ASTM D-1238-62T; and

(iii) at least one peroxide vulcanizing *or cross-linking* agent *as the only vulcanizing or cross-linking agent in said composition,* said composition comprising [by weight to 100 parts of saturated polar polymer (i),] about 10 to 400 parts by weight of ethylene copolymer [(ii)] and about 0.1 to 10 parts by weight of peroxide vulcanizing agent *per 100 parts of saturated polar polymer,* [(iii),] and said composition having a cross-linking half-life of about 0.2 to 1.5 minutes at 205° C., *a minimum torque value in the range of 2 to 15 in-lbs. at 205° C., and a scorch time in the range of 0.5 to 2.0 minutes at 205° C.*

B1 4,407,757 (643rd)

ARALKYL CARBOXYLIC ACID COMPOUNDS

Hiroshi Morimoto, Hyogo; Isuke Imada, Osaka; Masazumi Watanabe, Osaka, and Mitsuru Kawada, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Reexamination Request No. 90/001,005, May 7, 1986.

Reexamination Certificate for Patent No. 4,407,757, issued Oct. 4, 1983, Ser. No. 221,613, Dec. 31, 1980.

Division of Ser. No. 961,021, Nov. 15, 1978, Pat. No. 4,271,083, which is a division of Ser. No. 573,158, Apr. 30, 1975, Pat. No. 4,139,545.

Claims priority, application Japan, May 2, 1974, 49-50003

Int. Cl.[4] C11C *1/00, 3/02*

U.S. Cl. 260—413

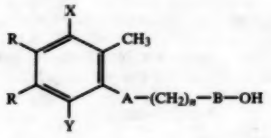
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claims **2–20**, dependent on an amended claim, are determined to be patentable.

New claim **21** is added and determined to be patentable.

1. A compound of the formula



wherein R represents alkyl of 1–4 carbon atoms or alkoxy of 1–4 carbon atoms, A represents —CH_2—, —CO— or

B represents —CH_2— or —CO—, n represents an integer of 1 to 8, X represents hydrogen or hydroxyl and Y represents hydroxyl, or the corresponding ester with methanol at the function shown by —B—OH when B is —CO—, or the corresponding ester with acetic acid at the function shown by —B—OH when B is —CH_2—, *excluding the compound where both R groups are methyl, both X and Y are hydroxyl, both A and B are —CH_2— and n is 1, and also excluding the compound*

where both R groups are methyl, both X and Y are hydroxyl, A is —CH_2—, B is —CO— and n is 1.

B1 4,476,308 (644th)

1-PYRROLIDINE ACETAMIDES

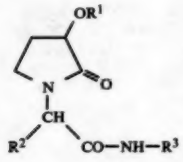
Werner Aschwanden, Ettingen, and Emilio Kyburz, Reinach, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Reexamination Request No. 90/000,919, Dec. 6, 1985.
Reexamination Certificate for Patent No. 4,476,308, issued Oct. 9, 1984, Ser. No. 506,147, Jun. 20, 1983.
Continuation of Ser. No. 397,751, Jul. 13, 1982, abandoned.
Claims priority, application Switzerland, Jul. 24, 1981, 4849/81; May 5, 1982, 2768/82
Int. Cl.[4] C07D *401/12*
U.S. Cl. 546—208

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–9** is confirmed.

1. A pyrrolidine of the formula



wherein R^1 is hydrogen or lower alkanoyl, R^2 is hydrogen or lower alkyl and R^3 is hydrogen, lower alkyl or a group of the formula $—(CH_2)_n—NR^4R^5$, wherein n is a whole number of 2 to 4 and R^4 and R^5 each, independently, are hydrogen or lower alkyl, or R^4 and R^5 taken together with the nitrogen atom are a pyrrolidinyl, piperidinyl, piperazinyl or morpholinyl group which is optionally substituted by one or two lower alkyl groups,

an enantiomer thereof, or a pharmaceutically acceptable acid addition salt of a compound of formula I or an enantiomer thereof, which is basic.

B1 4,483,720 (645th)

PROCESS FOR APPLYING THERMAL BARRIER COATINGS TO METALS

Robert W. Bartlett, Tucson, Ariz., and Paul J. Jorgensen, Cupertino, Calif., assignors to S R I International, Menlo Park, Calif.

Reexamination Request No. 90/000,825, Jul. 22, 1985.
Reexamination Certificate for Patent No. 4,483,720, issued Nov. 20, 1984, Ser. No. 325,504, Nov. 27, 1981.
Int. Cl.[4] C23C *11/00, 8/10*
U.S. Cl. 148—6.3

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 1 is determined to be patentable as amended.

Claims 2–7, dependent on an amended claim, are determined to be patentable.

1. A method of coating a metal substrate with a [protective coating which comprises] *metal oxide to provide a thermal barrier, said method comprising:*

(a) providing a substrate metal to be coated, said substrate being a structural article suitable for use in a mechanical structure having high mechanical strength,

(b) providing an alloy or mixture of at least one metal M_1, and at least one other metal M_2, *M_1 constituting not less than 50% by weight of the alloy or mixture, M_2 being present in substantial amount but not exceeding 50% by weight of M_1 and M_2, M_1 and M_2 being* selected according to the following criteria:

(1) M_1 is susceptible to oxidation by molecular oxygen at an elevated temperature in an atmosphere having a very small partial pressure of oxygen, such oxidation resulting in a stable oxide of M_1,

(2) M_2 does not form a stable oxide *and remains substantially entirely unoxidized* under such conditions [and it forms an alloy with at least one component of the substrate on heat treatment of the coated material];

(c) applying such alloy or mixture to a surface of the substrate, [under conditions such that the surface only is coated with an alloy of M_1 and M_2 and] *(1) by dipping the substrate in a molten alloy of M_1 and M_2 or (2) by applying a slurry in a volatile liquid of the metals M_1 and M_2 in finely divided form either as the separate metals or as an alloy of M_1 and M_2, then vaporizing the solvent and fusing the metals;*

(d) effecting selective oxidation of M_1 at an elevated temperature [in the coating] without substantial oxidation of M_2.

[(e) the proportion of M_1 to M_2 in said alloy or mixture of M_1 and M_2 being substantial and sufficient to result in a coating containing sufficient oxide of M_1 to function as a substantial thermal barrier,]

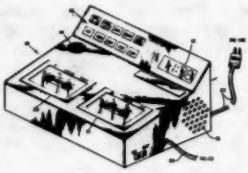
(e) said method resulting in a coating which is bonded to the substrate, said coating having an intermediate bonding layer and an outermost dense oxide layer which is substantially entirely an oxide of M_1 and serves as a protective thermal barrier for the substrate, said intermediate bonding layer having (1) an interaction zone and (2) a subscale zone, said interaction zone being composed substantially entirely of unoxidized M_2 which is bonded to the substrate by the alloying of at least one component of M_2 with at least one component of the substrate, and said subscale zone being composed of an adequate amount of M_2 and the oxide of M_1 so as to establish a firm bond with the interaction zone, said outermost dense oxide layer and said intermediate bonding layer being formed by said step (d), said intermediate bonding layer serves to bond said outermost dense oxide layer to the substrate.

B1 4,500,753 (646th)

TELEPHONE ANSWERING APPARATUS WITH RECORDED TIME OF DAY AND DATE

Luther C. Plunkett, Jr., Atlanta, Ga., assignor to Lanier Business Products, Inc., Atlanta, Ga.

Reexamination Request No. 90/000,875, Oct. 4, 1985.
Reexamination Certificate for Patent No. 4,500,753, issued Feb. 19, 1985, Ser. No. 411,529, Aug. 25, 1982.
Int. Cl.[4] H04M *11/00*
U.S. Cl. 179—6.03



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–10 are cancelled.

[1. In an apparatus for automatically recording on a recording media audio incoming message signals received over a telephone line including means responsive to a ring signal on the telephone line for generating an outgoing message signal for transmission over the telephone line to the caller and means responsive to detection of the end of said outgoing message signal for conditioning a recorder to record said incoming message signals, the improvement comprising:

clock means for continuously maintaining the time of day by storing digital time signals representative of the time of day;

call received means responsive to said ring signal for automatically retrieving said stored digital time signals upon receipt of a call and for providing output digital time signals associated with the time of day at which a call was received;

speech generation means responsive to being provided said output digital time signals for generating audio speech time signals characteristic of said output digital time signals; and

means for recording said audio time signals on said recording media contiguous to said incoming message signals to associate each message received with the time of day at which such message was received.]

B1 4,503,007 (647th)

POLYPROPYLENE STRAP AND METHOD OF MANUFACTURING THE SAME

Hiroyaki Matsumoto, Tokyo, Japan, assignor to Tsukasa Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Reexamination Request No. 90/001,042, Jun. 23, 1986.
Reexamination Certificate for Patent No. 4,503,007, issued Mar. 5, 1985, Ser. No. 545,687, Oct. 26, 1983.
Division of Ser. No. 500,382, Jun. 2, 1983, Pat. No. 4,451,524.
This application Jun. 23, 1986, Ser. No. 545,687
Int. Cl.[4] D01D *5/12*
U.S. Cl. 264—210.7

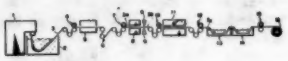
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim 1 is confirmed.

1. A method of manufacturing polypropylene straps, said method comprising the steps of:

(a) extruding a belt-like sheet of polypropylene material from a die;

(b) stretching the belt-like polypropylene material in the lengthwise direction thereof at a volume ratio of 4–9;



(c) heating the surfaces of the resulting belt-like material in a manner such as to put only the molecular chains in the outer layers thereof in a non-oriented state; and then

(d) stretching the belt-like material as a whole at a draw ratio of 1.2–3,

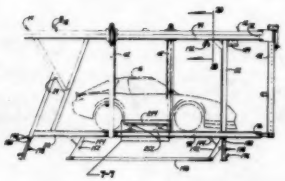
whereby said molecular chains in said outer layers are partially reoriented and contribute to the strength of said straps.

B1 4,574,614 (648th)

APPARATUS FOR REPAIRING AND STRAIGHTENING VEHICLES

Carl R. Field, Des Moines, Iowa, assignor to Duz-Mor, Inc., Des Moines, Iowa

Reexamination Request No. 90/000,985, Apr. 14, 1986.
Reexamination Certificate for Patent No. 4,574,614, issued Mar. 11, 1986, Ser. No. 565,979, Dec. 27, 1983.
Filed Apr. 14, 1986, Ser. No. 565,979
Int. Cl.[4] B21D *1/12*
U.S. Cl. 72—447



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–9 and 16–19 is confirmed.

Claims 10 and 12 are determined to be patentable as amended.

Claims 11 and 13–15, dependent on an amended claim, are determined to be patentable.

New claim 20 is added and determined to be patentable.

10. Apparatus for repairing and straightening vehicles comprising:

vehicle supporting means for receivingly supporting the wheels of a vehicle, *said vehicle supporting means having a front end, a rear end, sides connected to and between said front and rear ends, a top, a bottom and an exterior periphery around the edges thereof between the top and bottom*;

tower means attached to said vehicle supporting means for pulling *in a mostly horizontal direction* on a part of a vehicle disposed on said vehicle supporting means;

means connected to said tower means for attachment to a vehicle body;

movement means for permitting said tower means to be movable with respect to said vehicle supporting means, said movement

means including means for positioning at least a portion of said attachment means directly above any point on the exterior periphery of the support means from one end of said support means, around in each direction from said one end to the sides of said support means; and

lifting means adapted to be supported directly on top of a floor and operably connected to said vehicle supporting means for selectively raising or lowering said vehicle supporting means *and said tower means* while maintaining said vehicle supporting means level.

REISSUES

MARCH 10, 1987

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,367
DISPOSABLE RAZOR WITH SLIDING CAP

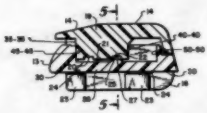
Peter Bowman, Sandy Hook, Conn., and Allan S. Frieze, Alpine, N.J., assignors to Warner Lambert Company, Morris Plains, N.J.

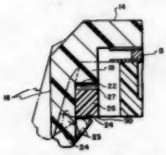
Original No. 4,443,938, dated Apr. 24, 1984, Ser. No. 359,341, Mar. 18, 1982. Continuation-in-part of Ser. No. 108,747, Dec. 31, 1979, Pat. No. 4,328,615. Application for reissue Jul. 15, 1985, Ser. No. 755,370

The portion of the term of this patent subsequent to May 11, 1999, has been disclaimed.

Int. Cl.[4] B26B *21/06*

U.S. Cl. 30—47 **24 Claims**





24. A razor blade assembly comprising:

a seat member having a continuous skin-engaging guard along the forward margin thereof and having an upwardly facing blade support surface, said seat member being arranged to be fixedly held by a handle extending transversely relative to the blade support surface;

a razor blade rigidly and permanently fixed to said seat member with its cutting edge forwardly directed and spaced rearwardly of said guard; and

a cap permanently mounted on said seat member above said blade, said cap and seat member being formed with interlocking elements which allow relative sliding motion of the cap and the seat member in a fore-and-aft direction through a definite stroke between a first position in which the blade edge is in front of the cap and is exposed for shaving, and a second inoperative position in which the cap shields the blade edge from inadvertent external contact, and detenting means for releasably retaining said first and second positions.

Re. 32,368
COLLISION AVOIDANCE SYSTEM FOR AIRCRAFT

Chubei Funatsu, Yokahama, and Toshikiyo Hirata, Samukawa, both of Japan, assignors to Toyo Tsushinki K.K., Samukawa, Japan

Original No. 4,107,674, dated Aug. 15, 1978, Ser. No. 714,335, Aug. 13, 1976. Application for reissue Jun. 14, 1984, Ser. No. 620,798

Claims priority, application Japan, Aug. 15, 1975, 50/99674

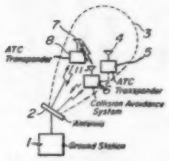
Int. Cl.[4] G01S *9/56*

U.S. Cl. 342—45 **11 Claims**

12. A collision avoidance system for aircraft which are each equipped with an ATC transponder comprising:

an interrogation station located on a first aircraft and having a secondary surveillance radar function, said interrogation station emitting an interrogation signal which is to be responded to by an ATC transponder of a second aircraft;

a detection means located on said first aircraft for detecting the existence of said second aircraft in proximity to said first aircraft;



an output control means operatively connected to said detection means for altering at least one of an output power and a transmission period of said interrogation signal emitted by said interrogation station when said detection means detects information concerning said second aircraft which exceeds a predetermined value.

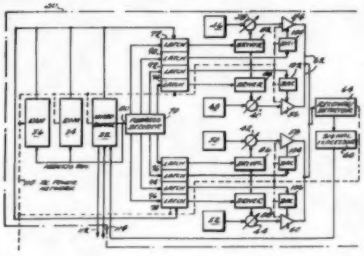
Re. 32,369
MONOLITHIC MICROWAVE INTEGRATED CIRCUIT WITH INTEGRAL ARRAY ANTENNA

Ronald J. Stockton, Boulder County, and Robert E. Munson, Boulder, both of Colo., assignors to Ball Corporation, Muncie, Ind.

Original No. 4,490,721, dated Dec. 25, 1984, Ser. No. 565,516, Dec. 27, 1983. Continuation of Ser. No. 207,289, Nov. 17, 1980, abandoned. Application for reissue Oct. 7, 1985, Ser. No. 785,304

Int. Cl.[4] H01Q *3/26;* **H01P** *3/08*

U.S. Cl. 342—368 **28 Claims**



12. A monolithic integrated circuit antenna system comprising a plurality of antenna elements arranged in an array for transmitting or receiving electromagnetic waves, and a phasing and r.f. feeding network including plural FET integrated circuit structures electrically connected to control the electrical phase shift of electrical currents flowing to or from each said element, said antenna elements and said phasing network being integrated on a single substrate of semi-insulating GaAs semiconductor material having a resistivity of about 10^7 to 10^9 ohm-cm.

Re. 32,370

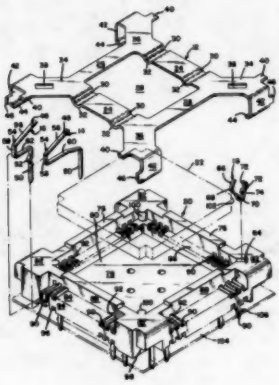
LOW HEIGHT ADS CONNECTOR

Edward J. Bright, Elizabethtown, and Steven J. Kandybowski, Tower City, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Original No. 4,427,249, dated Jan. 24, 1984, Ser. No. 412,680, Aug. 30, 1982. Continuation of Ser. No. 230,202, Feb. 2, 1981, abandoned. Application for reissue Jan. 23, 1986, Ser. No. 821,649

Int. Cl.[4] H01R *23/68*

U.S. Cl. 339—17 CF **6 Claims**



5. A cover for pressing and retaining an active device substrate, or the like, into engagement with contact elements in an insulating housing having a downwardly facing shoulder at each of two adjacent corners, said cover comprising:

a frame;

arms extending outwardly from each of two adjacent corners of the frame,

a latch attached to each arm and having a depending member with an inwardly projecting lip at the free end thereof so that the cover may be attached to the housing by forcing the lip on each latch in and under the downwardly facing shoulders on the housing corners; and

outwardly projecting tabs on each arm and on each depending member, said tabs on the depending member providing a catch for a pry-type tool tip and the tabs on the arms providing a fulcrum point so that upon pivoting the tool, the inwardly projecting lip may be withdrawn from the shoulder.

6. A connector for being mounted on a printed circuit board and for electrically connecting conductive areas on an active device substrate to conductive areas on said circuit board, said connector comprising:

dielectric housing means having side walls enclosing an upwardly open compartment adapted for removably receiving an active device substrate and downwardly facing shoulders on at least two adjacent corners of said sidewalls,

conductive contact means disposed in said housing means and having upper limb means for electrically engaging said conductive areas on said active device substrate received in said compartment and lower limb means depending from said housing means for electrically engaging said conductive areas on said circuit board; and

a cover for being attached to said housing means for retaining said active device substrate in said compartment, said cover having at least two outwardly extending arms, said arms having latch means at the free ends thereof with said latch means including a depending member with an inwardly projecting lip at the free end thereof for being removably received in under said downwardly facing shoulders on said housing means, and further having outwardly projecting fulcrum means on each arm and outwardly projecting tabs on each depending member with said fulcrum means on said arms providing a fulcrum point for a pry-type tool and said tabs providing a catch for a tip on said tool so that upon pivoting said tool about said fulcrum means, said inwardly projecting lip may be withdrawn from said downwardly facing shoulders.

PLANT PATENTS

GRANTED MARCH 10, 1987

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,895
ROSE PLANT JACTAN

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Sep. 3, 1985, Ser. No. 771,848
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—3 1 Claim

1. A new and distinct variety of rose plant of the climber class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its unusual golden tan flower color in the bud and fresh open flower stage coupled with its vigorous climbing habit and its heavy and continuous flower production.

5,896
ROSE PLANT JACETTE

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Sep. 3, 1985, Ser. No. 771,847
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—14 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of an attractive high centered white flower with pleasing fragrance coupled with heavy continuous flower production on long straight stems. Also, these flowers occasionally have foliaceous sepals.

5,897
STRAWBERRY JEWEL

John C. Sanford, Geneva, N.Y.; Donald K. Ourecky, Lauderdale Lakes, Fla., and Jack E. Reich, II, Geneva, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Jul. 2, 1985, Ser. No. 751,091
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—48 1 Claim

1. The new and distinct variety of strawberry herein described and illustrated and identified by the characters enumerated above.

5,898
ASIATIC LILY NAMED VANESSA

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Gresham, Oreg.

Filed Mar. 11, 1985, Ser. No. 710,496
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct variety of hybrid Asiatic lily plant, substantially as herein shown and described, characterized in particular by its yellow and gold flower color pattern and its relatively light maculation, which features are unique in the Asiatic hybrid division of lilies suited to forcing and commercial cultivation; by its vigorous growth and propagation characteristics; the excellence of its flower form and substance; its versatility both as a garden plant and as a plant produced from precooled bulbs forced for cut flower production; and its unique mid-season time of flowering to broaden the cut flower season.

5,899
KALANCHOE PLANT NAMED INSPIRATION

Hermann Finger, Wiesmoor, Fed. Rep. of Germany, assignor to Wiesmoor-Gartnerie und Baumschule GmbH, Fed. Rep. of Germany

Filed Jul. 1, 1985, Ser. No. 750,602
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of Kalanchoe named Inspiration, as described and illustrated, and particularly characterized by its abundant bright red flowers, semi-compact growth habit with excellent branching, dark green dense foliage, and its good keeping qualities.

5,900
FICUS PLANT GREEN GEM

Jack D. Ingwersen, 1620 Ridgeway St., Oceanside, Calif. 92054

Filed Apr. 1, 1985, Ser. No. 719,005
Int. Cl.[4] A01H *5/12*
U.S. Cl. Plt.—88 1 Claim

1. A new and distinct variety of *Ficus retusa nitida* plant substantially as shown and described, characterized by its compact growth of foliage which has thick leathery leaves, particularly when the leaves are matured, the upper surfaces of the leaves having a very-glossy, ivy-green color, and the nodes being spaced in close proximity with each other along the branches and stems, with its older, relatively husky branches bearing finely shreading brown bark, compared to the concrete gray of *Ficus retusa nitida*, and producing slender aerial roots near the base of the plant, the configuration of the leaves being relatively elliptic with an attenuate-accuminate apex, and an acute base structure, with the margin thereof being revolute and undulating.

PATENTS

GRANTED MAR. 10, 1987

ERRATA

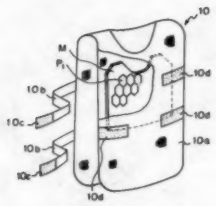
For CLASS	See PATENT NO.
029-558	4,648,761
540-124	4,648,992
540-134	4,648,993
427-082	4,649,024
380-021	4,649,233
379-138	4,649,234
379-348	4,649,235
379-327	4,649,236
380-020	4,649,419
357-084	4,649,424
379-411	4,649,905
378-022	4,649,544
380-032	4,649,549
382-041	4,649,568

PATENTS

GRANTED MARCH 10, 1987

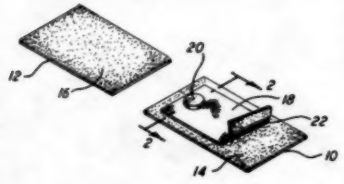
GENERAL AND MECHANICAL

4,648,136
HUMAN BODY PROTECTOR
Susumu Higuchi, Abiko, Japan, assignor to C. Itoh & Co., Ltd., Osaka, Japan
Filed Jun. 4, 1986, Ser. No. 870,711
Int. Cl.[4] F41H *1/02*
U.S. Cl. 2—2.5 **8 Claims**



1. A human body protector having a flexibility making said protector capable of fitting a human body, characterized in that said protector is comprised of a front layer consisting of group of segments (P_1) of blade-proof plate having a plurality of connecting apertures (1) and spread over the body by placing circumferential edges of adjacent segments in contact with each other in a state wherein spaces between the adjacent are substantially eliminated, and a rear layer consisting of another group of segments (P_2) of blade-proof plate made and spread over the body in the same manner as the segments (P_1), and each of said segments constituting both layers being superimposed in a shifting state such that each segment of one layer can cover joining lines (L_1 or L_2) between each segment of the opposite layer, respectively, the front layer and the rear layer being connected in a state wherein they are capable of moving slightly relative to each other by inserting retaining members (6) into each connecting aperture (1) at a position in which it corresponds with an aperture in the other layer; and the other retaining members (7) being inserted at cross points of joining lines (L_1) of the front layer and the joining lines (L_2) of the rear layer existing when both layers are superimposed.

4,648,137
SHIRT WITH ADJUSTABLE COLLAR OPENING
Leonard W. Cooper, 7746 Deerfield Rd., Liverpool, N.Y. 13088
Filed Feb. 27, 1985, Ser. No. 706,136
Int. Cl.[4] A41B *3/02*
U.S. Cl. 2—141 R **2 Claims**



1. A shirt construction with a collar which may selectively be worn in either an open position or a closed position of adjustable size, said construction comprising:

(a) a shirt body having a neck opening encircled by a neck band and a frontal opening extending from and including said neck band for at least a portion of the vertical length of the shirt;

(b) a wing-type collar attached to and folded over said neck band with portions of the latter extending toward one another on opposite sides of said frontal opening between opposing edge portions of said collar which extend downwardly from the attachment of said collar to said neck band;

(c) a first strip of material having a first predetermined length and width permanently affixed to said neck band on one side of said frontal opening and covered by said collar;

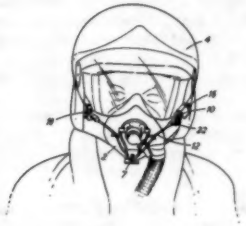
(d) a second strip of material having a second, predetermined length and width permanently affixed to said neck band on the opposite side of said frontal opening and covered by said collar;

(e) a third strip of material having a third, predetermined length, less than said first and second predetermined widths;

(f) said first and second strips each having an outwardly facing surface of one and said third strip having an inwardly facing surface of the other of a hook and pile material; and

(g) means pivotally attaching said third strip adjacent one end thereof to said first strip for movement with respect thereto between a first position, wherein said third strip is superposed with and lies within the borders of said first strip and is releasably attached thereto by said hook and pile surfaces, and a second position, wherein said third strip is moved substantially 180° about said pivotal attachment to extend across said frontal opening of said neck band and is releasably attached in an end portion opposite said one end to said second strip by said hook and pile surfaces, the distance of extension of said third strip across said frontal opening being selective by the wearer, whereby the degree of closure of the collar is selectively adjustable.

4,648,138
RETENTION AND QUICK RELEASE MECHANISM
Kenneth A. Brigden, London, and Michael Briggs, St. Albans, both of England
Filed Aug. 7, 1985, Ser. No. 763,403
Claims priority, application United Kingdom, Aug. 10, 1984, 8420404
Int. Cl.[4] A44B *11/26*; A42C *5/04*
U.S. Cl. 2—421 **7 Claims**



1. A retention and quick release mechanism for securing a mask or facial protective device to headgear, comprising at least two flexible members each attached at one end to the mask or facial protection device and having an attachment member at its other end, and a locking device for receiving each said attachment member, said locking device comprising:

(a) a housing,

(b) means for attaching said housing directly to the headgear,

(c) two retention members mounted in said housing for rotation about parallel spaced axes between a retaining position and a release position,

(d) said retention members being shaped to partially surround said attachment member in the retaining position so as to hold the attachment member against withdrawal from said housing and to release said attachment member only when both said retention members are in the release position,

(e) means resiliently biasing said retention members to the release position, said retention members and said attachment member being shaped so that as said attachment member is pushed into said housing it engages said retention members and rotates them against the bias of said biasing means to the retaining position,

(f) two locking members, one for each of said retention members, each mounted in the housing for rotation between a locking position in which it engages the associated said retention member to hold it in the retaining position and a release position in which said retention member can move to its release position,

(g) means resiliently biasing each said locking member to the locking position,

(h) each said locking member having the grip portion projecting from said housing, said two grip portions being positioned so that they can be gripped between the user's finger and thumb and pressed towards one another thereby to rotate the levers simultaneously to the release position,

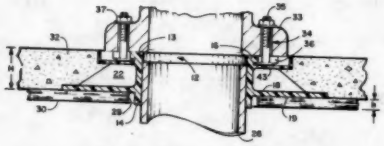
(i) said retention members, locking members and attachment members being arranged so that said retention members can move to their release position only when both said locking members are in the release position.

4,648,139

MOUNTING RING ASSEMBLY FOR A TOILET BOWL

Darryll Stokes, 11576 Bridle Path Ln., Lakeside, Calif. 92040

Filed Jul. 12, 1985, Ser. No. 754,250
Int. Cl.[4] E03D *11/16*
U.S. Cl. 4—252 R **6 Claims**



1. A mounting ring assembly for a toilet bowl comprising:

a vertically oriented tubular member having a predetermined height, said tubular member having a top end and a bottom end;

an annular flange extending radially outwardly from the top end of said tubular member;

a base plate extending radially outwardly from the outer surface of said tubular member, said base plate being located a predetermined height above the bottom end of said tubular member, a plurality of nail apertures in said base plate;

said tubular member, said annular flange, and said base plate being molded as an one-piece member of resinous plastic material; and

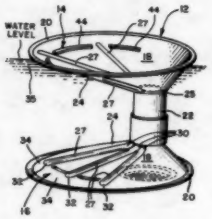
means for attaching a plurality of bolts to said annular flange that are used to fasten the base of a toilet bowl to said mounting ring assembly comprising a plurality of radially extending open end slot assemblies in the top surface of said annular flange, each of said open slot (as-) assemblies having a bolt head slot and a bolt shank slot, a framework around the open end of said slot having a bottom wall, a pair of laterally spaced side walls, and an end wall, said bottom wall also forming the bottom surface of said bolt head slot, the height of the side walls and end wall of said framework being substantially the same as the thickness of said annular flange.

4,648,140

DISH WASHING AID DEVICE

Walter F. Bogusz, 4350 S. Winchester Ave., Chicago, Ill. 60609

Filed May 30, 1985, Ser. No. 739,285
Int. Cl.[4] A47L *17/02*
U.S. Cl. 4—654 **11 Claims**



1. A device for accommodating washing and rinsing of dishes and other articles in a kitchen sink having a single basin comprising side walls and a bottom wall with a drain, the basin being adapted to be filled with wash water and soiled dishes and other articles for soaking and washing therein and there being a faucet extending over the basin for selective discharge of rinse water,

said device comprising a pair of superposed members and means including a drain passage and adjustably interconnecting said members,

at least one of said members being formed and arranged to seal the drain from the wash water within the basin, and

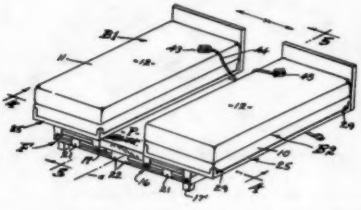
the other of said members comprising a receptacle adapted to extend above the level of the wash water and adapted to drain through said passage and through said one member into the drain and being selectively positionable about said interconnecting means beneath said faucet for diverting water from said faucet over said dishes and articles being withdrawn from said wash water.

4,648,141

POWER OPERATED SEPARABLE BEDS AND PLATFORM

Mansour N. Mansouris, 1717 Sanysidro Dr., Beverly Hills, Calif. 90210; Masoud N. Mansouri, 427 Robinhood La., Los Angeles, Calif. 90049, and Kambiz Imani, 11667 Ohio Ave., Los Angeles, Calif. 90025

Filed Jun. 20, 1985, Ser. No. 746,859
Int. Cl.[4] A47C *19/00*
U.S. Cl. 5—8 **14 Claims**



1. A composite bedding unit comprised of two like and

adjoining single bed units individiually separable from a horizontal platform and each having a head and foot rail and adapted to be juxtaposed to a median line in a primary double bed condition and to be separated from the median line to a secondary single bed condition, and including;

the horizontal platform having transversely disposed head and foot rail supports of slotted C-section configuration and extending parallel one with the other and each transversely slotted substantially coextensively beneath an overlying one of the two single bed units when they are adjacently juxtaposed at the median line in said double bed condition,

each of the two single bed units having a head and foot rail extending between inner and outer side rails and complementary to and overlying the head and foot rail supports of the platform and having laterally spaced roller supports carried by the head and foot rails and engageable in the C-section configuration of the head and foot rail supports of the platform to individually carry each of the two single bed units for transverse movement toward and away from each other,

the head and foot rails of wach single bed unit having a roller support spaced inward from the outer rail thereof a distance substantially equal to travel of the single bed unit, and having a roller support at the inner rail thereof, said rollers bearing downwardly within the C-section configuration for rolling support,

the slotted C-section configurations of the head and foot rail supports of the platform having windows aligned with the roller supports and freely passing the roller support for entry and withdrawal thereof into and from within the C-section configuration of the head and foot rail supports,

and transport means for postioning either and both of the two single bed units by transverse movement into either of said primary double bed condition and said secondary single bed condition.

4,648,142

APPARATUS AND METHOD FOR SUPPORTING AN INFANT IN A GENERALLY SEMI-FOWLER POSITION

Rose M. Bruning, 405 S. 127th St., Omaha, Nebr. 68154

Filed Oct. 15, 1984, Ser. No. 660,716
Int. Cl.[4] A47D *9/00*
U.S. Cl. 5—93 R **11 Claims**

1. An apparatus for supporting an infant in a generally semi-fowler position, comprising in combination,

a crib including head, foot and opposite side boards, a generally planar mattress support frame, height adjustable support means for supporting the opposite ends of said mattress support frame on said crib, and a generally flat mattress resting on said mattress support surface,

an infant positioning device supported on said mattress, said infant positioning device comprising

a generally U-shaped pad having opposite closed and open ends and an elongated opening therethrough of a size and shape for receiving an infant on said mattress,

a bed covering fitted onto said pad so as to cover at least the top sides of said opening, and

means for securing said pad in a position on said mattress, said opening having a width and length which is sufficiently limited to restrain an infant from altering its position by any substantial change of direction, and

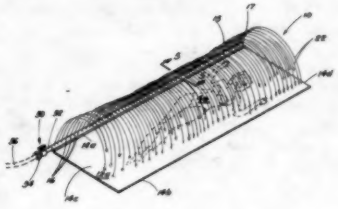
the open end of said pad facing the headboard and the longitudinal centerline of said opening being generally parallel to said side boards whereby, upon elevation of the head end of the mattress above the foot end thereof, an infant placed in said opening with its head facing the head board will be maintained in a semi-fowler position.

4,648,143

SUNBATHING APPARATUS HAVING WATER SPRAY COOLING MEANS

Connie C. Breaux, and Roddy P. Breaux, both of P.O. Box 59, Gheens, La. 70355

Filed Jun. 3, 1985, Ser. No. 740,879
Int. Cl.[4] A47C *21/04;* **A47K** *3/22;* **B05B** *17/00*
U.S. Cl. 5—417 **4 Claims**



1. A sunbathing apparatus having water spray cooling means comprising:

a. a generally rectangular flexible sheet member of a light reflecting material, and having a first marginal side edge of a light absorbing material, said side edge being integral with the sheet member and being of a tubular channel shape;

b. an elongated flexible water conduit integrally attached to said first marginal side edge of said sheet member, said conduit and said marginal side edge having a plurality of longitudinally spaced perforations therealong, said perforations positioned toward the upper surface of said sheet member, whereby each of said perforations in said marginal side edge of said sheet member is radially aligned with one of said perforations in said conduit; and

c. means for coupling said conduit to an operative supply of water and controlling the rate of flow of water provided said conduit, whereby water flowing into said conduit and out through said perforations in said conduit and said marginal side edge of said sheet member is directed upwardly and inwardly of said marginal edge of said sheet member so as to direct a spray of water onto the upper surface of said sheet member.

4,648,144

BRACKET FOR SUPPORTING TRACTION WEIGHTS

Richard Rose, P.O. Box 66973-158, Houston, Tex. 77006

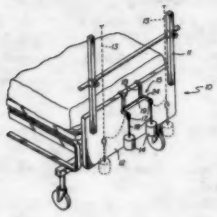
Filed Jun. 17, 1985, Ser. No. 745,141
Int. Cl.[4] A47C *21/00*
U.S. Cl. 5—503 **6 Claims**

1. A bracket for installation on the foot board of hospital beds for supporting orthopedic traction weights comprising

a pair of parallel laterally spaced hook elements, each having a first elongated vertical portion, a horizontal portion extending outwardly perpendicular thereto at the top end thereof, and a second vertical portion depending from the horizontal portion parallel to the first vertical portion and spaced therefrom sufficient to slidably engage the top portion the hospital bed foot board,

a horizontal element secured to the bottom of each said hook

element first vertical portion to extend transversely therebetween and having opposed ends which extend perpendicularly outward therefrom, and



an arcuate notch formed in the top surface of the outwardly extended ends of said horizontal element to removably receive the hook portion of an orthopedic traction weight and support said traction weight thereon.

4,648,145

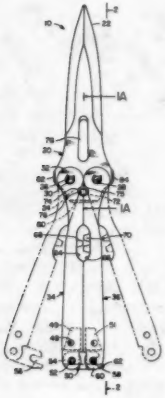
FOLDING POCKET TOOL AND KNIFE

Philip V. Miceli, 1900 Shanklin Ave., Baltimore, Md. 21234

Filed Mar. 28, 1983, Ser. No. 479,841

Int. Cl.[4] B26B *11/00*; B25F *1/00*

U.S. Cl. 7—158 **7 Claims**



1. In a system of folding pocket tool and knife in combination, including a blade having a cutting end and a butt end, a pair of handles having first and second ends and a respective longitudinal slot in each handle, means pivotally connecting each handle first end to the butt end of the blade with the longitudinal slots opposable for covering the blade cutting end in a first pivotal position of said handles and with the blade exposed and the handles in contact together forming a grip for the exposed blade in a second pivotal position of said handles; the improvement comprising: said pair of handles being a first handle and a second handle substantially similar to the first handle, said means pivotally connecting substantially symmetrically connecting the first and second handles to said butt end of the blade, a block, means pivotally affixing the block to the second end of the first handle, said block having: a free end and means for detachably affixing the free end of the block to the second end of the second handle for selectively holding the handles together in either the first pivotal position or the second pivotal position, said first and second pins having respective first protruding ends proportioned for spanner-wrench use.

2. In a system as recited in claim 1, said first and second pins having respective second protruding ends proportioned for spanner wrench use, said second protruding ends being of different cross-sectional size from said first protruding ends.

4,648,146

APPARATUS FOR AND METHOD OF ASSEMBLING A TENSION TIE MEMBER

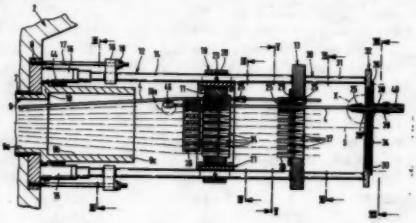
Oswald Nützel, Munich, and Egbert Zimmermann, Oberaudorf, both of Fed. Rep. of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 30, 1985, Ser. No. 728,757

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1984, 3437108

Int. Cl.[4] E01D *11/00*

U.S. Cl. 14—21 **18 Claims**



1. Apparatus for assembling an axially elongated cable or tie member made up of individual axially elongated elements each having opposite ends, such as steel wires, strands or the like, a tubular sheathing laterally enclosing the elements, and a first anchor plate and a second anchor plate each arranged for anchoring the opposite ends of said elements with said tubular sheathing extending between said first and second anchor plates, in assembling the tie member the elements are inserted, in turn, through the first anchor plate having conically shaped boreholes therethrough, then through said tubular sheathing and through conically shaped boreholes in the second anchor plate, and multi-part annular wedges for insertion into the conically shaped boreholes for anchoring the elements in at least the first anchor plate, wherein the improvement comprises at least one auxiliary plate spaced in the axial direction of said tie member from the first anchor plate on the opposite side thereof from the second anchor plate, means for maintaining said auxiliary plate in spaced relation from the first anchor plate in the axial direction of the tie member, said auxiliary plate having at least one borehole extending therethrough in the axial direction of the tie member and said at least one borehole in said auxiliary plate being axially alignable with at least one of the boreholes in the first anchor plate, a first tubular section secured to the side of said auxiliary plate facing toward said first anchor plate and forming an extension of said at least one borehole through said auxiliary plate, said first tubular section having an axially extending outside surface arranged to receive one said multi-part annular wedge in displaceable contact with the outside surface and the annular wedge being resiliently radially expanded on the outside surface of said first tubular section.

12. A method of assembling and installing an axially elongated tie member between spaced parts of a structure, the tie member being made up of a plurality of separate axially elongated elements in the form of steel wires or strands, a tubular sheathing laterally enclosing the tension elements, a pair of anchors spaced apart in the axial direction of the tie member and each anchor including an anchor plate for anchoring said tie member to a separate part of the structure, each anchor plate having boreholes therethrough for receiving one element in each borehole, each of the anchor plates having a final

position where the tie member is fully tensioned and anchored to a different part of the structure, and annular wedges engageable within said boreholes for anchoring the elements into the boreholes, comprising the steps of positioning at least one of the anchor plates in spaced relation from the final position thereof in the direction away from the other anchor plate, positioning an auxiliary anchor plate in spaced relation with one of the anchor plates and on the opposite side of the one of the anchor plates from the other anchor plate, inserting the elements individually first through the auxiliary anchor plate and then through the one of the anchor plates toward the other anchor plate passing through the tubular sheathing and finally through the other anchor plate, at least partially tensioning and anchoring the inserted elements in the auxiliary anchor plate, upon inserting all of the elements between the anchor plates moving the one of the anchor plates in the direction away from the auxiliary anchor plate into the final position thereof, and anchoring the elements into the one of the anchor plates and transferring the tension load on the elements from the auxiliary anchor plate to the one of the anchor plates.

4,648,147

SUPPORT FOR A TENSION TIE MEMBER, SUCH AS A DIAGONAL CABLE IN A STAYED GIRDER BRIDGE

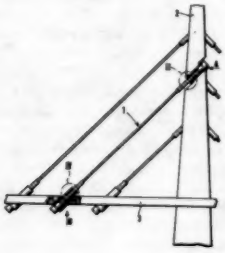
Egbert Zimmermann, Oberaudorf, and Oswald Nützel, Munich, both of Fed. Rep. of Germany

Filed Apr. 30, 1985, Ser. No. 728,756

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1984, 3434620

Int. Cl.[4] E01D *11/00*

U.S. Cl. 14—21 **15 Claims**



1. A support for an axially extending tension tie member, such as a diagonal cable in a stayed girder bridge, extending in the axial direction thereof unsupported between spaced anchor locations on a structure, said tension tie member being anchored to the structure at each of the spaced locations, anchor said tension tie member comprising axially elongated steel strand-like members, an axially elongated protective casing laterally enclosing said strand-like members, said support located adjacent at least one of the spaced anchor locations on the structure, wherein the improvement comprises that said support includes an annular bearing member extending in the axial direction of said tension tie member laterally encircling and in surface contact with the protective casing of said tie member at a position spaced from the at least one of the spaced anchor locations, an annular chamber extending in the axial direction of said tension tie member laterally encircling said annular bearing member said tie member extends through said protective casing into the structure from the other said spaced anchor location, the inside diameter of said annular chamber being larger than the outside diameter of said bearing member and forming an open space therebetween, and grout filling the open space in said annular chamber between the outside surface of said bearing member and the inside surface of said chamber for fixing said bearing member to the structure.

14. A method of forming a support for an axially elongated tension tie member extending continuously between spaced anchor locations on a structure with the tie member being anchored to the structure at each of the spaced anchor locations, said tie member having a tube-like protective casing at at least one end thereof, comprising the steps of forming an annular chamber in the structure adjacent and spaced from the at least one of the spaced anchor locations at the point where the tie rod member extends into the structure from the other spaced location with the annular chamber being open at the surface of the structure opposite the adjacent spaced anchor location, placing an annular bearing around and in surface contact with the protective casing of the tension tie member and inserting the bearing member into the annular chamber through the opening thereto with the radially outer surface of the bearing member being spaced inwardly from the surface of the annular chamber encircling the protective casing, closing the opening to the annular chamber, applying pressure to the bearing member in the axial direction of the tie member for effecting a seal around the protective casing at the opposite ends of the bearing member spaced apart in the long direction of the tie member, and grouting the space between the inner surface of the annular chamber encircling the protective casing and the radially outer surface of the bearing member with a hardenable material.

4,648,148

DEVICE FOR A RECIPROCATING WIPER SYSTEM

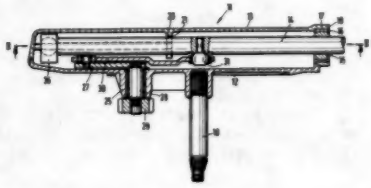
Bruno Egner-Walter, Heilbronn; Walter Neubauer, Lauffen; Eckhardt Schmid, Brackenheim, and Wolfgang Scholl, Gemmrigheim, all of Fed. Rep. of Germany, assignors to SWF Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

Filed Jul. 18, 1985, Ser. No. 756,786

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1984, 3426607

Int. Cl.[4] B60S *1/26*

U.S. Cl. 15—250.21 **17 Claims**



1. A reciprocating wiper system comprising:

a housing;

a self-adjusting bearing supported in said housing;

a piston linearly displaceable in and guided by said self-adjusting bearing;

a slide protected against twisting and longitudinal displacement and held on said piston such that it extends substantially perpendicular to said piston;

first and second guide elements fixed to said housing for longitudinally guiding said slide on both sides of said piston; and

a second self-adjusting bearing for guiding said slide in a closed manner on said first guide element, said second self-adjusting bearing being carried by said slide and being self-adjusting in at least a plane defined by said first and second guide elements;

said slide being displaceable on said second guide element with play between said slide and said second guide element.

4,648,149

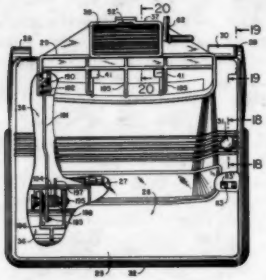
VACUUM CLEANER ASSEMBLY

Leonard Hampton, Normal, and Samuel E. Hohulin, Lexington, both of Ill., assignors to National Union Electric Corp., Bloomington, Ill.

Division of Ser. No. 659,166, Oct. 9, 1984. This application Mar. 10, 1986, Ser. No. 837,303

Int. Cl.[4] A47L *9/32*

U.S. Cl. 15—360 6 Claims



1. In an electric vacuum cleaner comprising a floor engaging unit and a handle assembly pivotally connected to the rear of said floor engaging unit, the improvement comprising resilient means coupled between said handle assembly and a point on said floor engaging unit forwardly of the pivotal interconnection between said handle assembly and floor engaging unit, said resilient means being connected to produce an upward force on the front of said floor engaging unit that increases with decreasing angles of said handle assembly to the horizontal, said resilient means comprising a lever having one end pivoted to said handle assembly, a bar affixed to said floor engaging unit, a coil spring received on said bar, and means holding one end of said coil spring fixed, the other end of said lever being connected to the other end of said coil spring.

4,648,150

VACUUM CLEANER

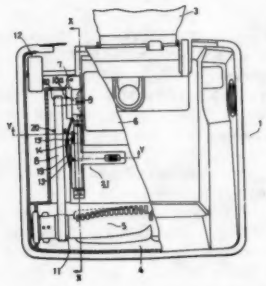
Takuya Morishita, Himeji; Akihiko Kurioka, Hyogo, and Akihiro Morita, Kakogawa, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Nov. 14, 1985, Ser. No. 797,824

Claims priority, application Japan, Nov. 20, 1984, 59-176898[U]; (Jul. 4, 1985, 60-102211[U]; Jul. 11, 1985, 60-105755[U]

Int. Cl.[4] A47L *5/10*

U.S. Cl. 15—389 12 Claims



1. A vacuum cleaner comprising a dust intake portion, a rotary brush provided in the intake portion, a drive motor for driving the rotary brush, a fan motor for suction of dust, a dust collector for the dust taken in, a dust transfer passage extending from the intake portion to the dust collector, a rotary brush pulley, a drive motor pulley, a belt coupling the above mentioned two pulleys for transmitting the power of the drive motor, at least one of the pulleys being frustoconical, and drive motor stopping means disposed at one side of the belt toward which said one pulley is diametrically smaller and pushable by the belt when the belt is displaced.

4,648,151

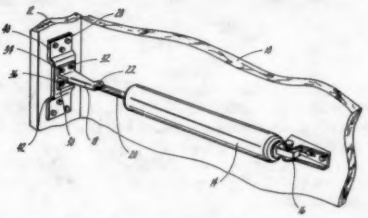
JAMB PLATE FOR DOOR CLOSER

Ernest P. Whaley, 6937 Arcola, Garden City, Mich. 48135

Filed May 23, 1985, Ser. No. 737,322

Int. Cl.[4] E05F *1/00*

U.S. Cl. 16—71 1 Claim



1. For use with a door closer adapted to be mounted between a door and a door jamb, the combination comprising:

a jamb bracket, and means pivotally connecting same to the door closer, the jamb bracket having a base with a plurality of first fastener-receiving openings;

an elongated jamb plate having an offset midsection between a pair of substantially co-planar ends including a first end and a second end, the first end of the jamb plate having second fastener-receiving openings and the opposite, second end of the jamb plate having third fastener-receiving openings, the second and third fastener-receiving openings being spaced on opposite sides of the midsection of the jamb plate, the midsection of the jamb plate having a surface suited to seat the base of the jamb bracket thereon, the midsection of the jamb plate being offset with respect to the first and second jamb ends a sufficient distance to provide a space for receiving a fastener element between the midsection of the jamb plate and the door jamb, when the jamb plate ends are in abutment with the door jamb, the jamb plate midsection having fourth fastener-receiving openings;

first fastener means receivable through the first fastener-receiving openings in the jamb bracket and the fourth fastener-receiving openings in the midsection of the jamb plate for fastening the jamb bracket on the surface of the jamb plate midsection;

second fastener means receivable in the second fastener-receiving openings for fastening the first end of the jamb plate to the door jamb;

third fastener means receivable in the third fastener-receiving openings for fastening the second end of the jamb plate to the door jamb; and

wherein said first fastener includes a threaded fastener receivable through at least one of the fastener-receiving openings in the jamb bracket and one of the fastener-receiving openings in the jamb plate midsection and in the door jamb to move the midsection of the jamb plate toward the door jamb and thereby cause the ends of the jamb plate to move longitudinally away from the midsection to increase the attachment between the second fastener means and the third fastener means and the ends of the jamb plate.

4,648,152
RETRACTABLE DOOR STOP

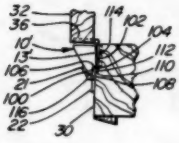
Harpal Grewall, P.O. Box 15, Site 12, SS1, Sudbury, Ontario, Canada

Continuation-in-part of Ser. No. 706,251, Feb. 28, 1985, abandoned, which is a continuation of Ser. No. 514,058, Jul. 15, 1983, abandoned. This application Jan. 13, 1986, Ser. No. 818,392

Claims priority, application Canada, Mar. 18, 1983, 423977

Int. Cl.[4] E05F 5/04

U.S. Cl. 16—82 3 Claims



1. In combination:

(a) a rectangular door frame assembly including a hinge-side jamb and a latch-side jamb;

(b) a door panel including a first face, an opposed second face, two opposed upper and lower edges, a hinge edge and a latch edge, said edges being of a width corresponding to the thickness of said panel;

(c) door hinge means securing said door panel to said hinge-side jamb for pivotal movement about a generally vertical first axis from a fully closed position at which the panel is generally parallel with the plane defined by the frame, to a fully opened position at which the door panel is at about right angles to said plane;

(d) a door stop comprising a door engaging member hingedly secured to said hinge-side jamb by a door stop hinge for pivotal movement about a generally vertical second axis spaced from said first axis, from an extended position wherein a surface section of said door engaging member abuts against said hinge edge when the door panel is in said fully opened position, to a retracted position wherein the door engaging member is remote from the adjacent face of the door panel when the door panel is in said fully closed position;

(e) the door engaging member being of the shape of a prism of a generally right-angled triangle cross-section, including a first, a second and a third side, all sides being generally vertical and being so arranged that in said extended position said first side is proximate said hinge-side jamb and said second side forms said surface section, the first side and the second side being at generally right angles relative to one another;

(f) said hinge side jamb including a non-recessed portion and a first recessed portion adapted to receive said hinge edge when said door is in said fully closed position, said recessed section being closer to said door hinge than said generallly vertical second axis, and an edge defined by said non-recessed portion and a sidewall connecting said recessed portion to said non-recessed portion;

said first side having a second recessed portion, adapted to receive the non-recessed portion of said hinge side jamb, which rests between said generally vertical second axis and said first recessed portion when said door engaging member is in said extended position.

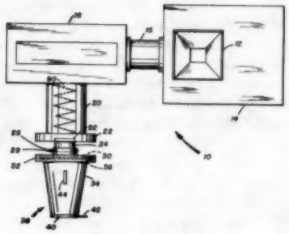
4,648,153
APPARATUS FOR PACKING AND FORMING GROUND BEEF

James H. Coroneos, 2205 Frederick Rd., Baltimore, Md. 21228

Filed Aug. 13, 1984, Ser. No. 640,446

Int. Cl.[4] A22C 7/00

U.S. Cl. 17—32 40 Claims



1. An apparatus attached to a meat processing device having a forcing means which forces meat therethrough, the apparatus comprising:

a connecting means attached to the processing device;

a locking collar having a mounting means for mounting the locking collar to the connecting means; the locking collar comprising:

a circular plate with an integral first annularly slotted ring section about the circumference of the circular plate;

a second annularly slotted ring section; and

a means for pivotably connecting the first and second ring portions to each other;

and, a mold having an annular lip at a first end and a second end, the first and second annularly slotted ring sections engaged with the mold annular lip via their annular slots;

wherein the meat exits the processing device, passes through the connecting means, into the mold where the meat is compressed and formed.

4,648,154
PORTIONING DEVICE

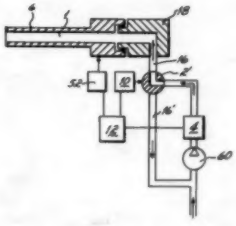
Georg H. Meinen, Meicastrasse 4, 2905 Edewecht (Oldb.), Fed. Rep. of Germany

Filed Oct. 19, 1984, Ser. No. 662,882

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1983, 3339274

Int. Cl.[4] A22C 11/06

U.S. Cl. 17—35 6 Claims



1. A machine for consecutively metering individual quantity portions of a stuffing substance such as sausage meat, said machine comprising

a nozzle through which said substance is stuffed into a casing,

feeding apparatus connected with said nozzle for feeding said substance under a stuffing pressure into said nozzle,

cut off apparatus connected with said feeding apparatus, said cut off apparatus being operable to divide said substance into individual quantity portions,

recirculation apparatus connected with said feeding apparatus, said recirculation apparatus permitting continuous recirculation of said substance therethrough at the stuffing pressure when no substance is being fed into said nozzle, and said recirculation apparatus preventing recirculation of said substance therethrough when said substance is being fed into said nozzle, and

a magnetic/inductive flowmeter device connected with said cut off apparatus for metering the amount of said substance to be provided in each individual quantity portion through said nozzle, said flowmeter device causing operation of said cut off apparatus when said quantity portion has been achieved as sensed by said flowmeter device, and said flowmeter device being located upstream of said cut off apparatus within said recirculation apparatus so as to continuously sense the quantity of said substance being fed into said nozzle during stuffing of a casing by use of said machine.

4,648,155

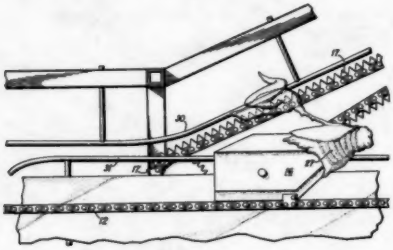
CHICKEN DEBONING APPARATUS AND METHOD

T. J. Burnett, Box 147, Rte. 1, Murrayville, Ga. 30564

Filed Mar. 18, 1986, Ser. No. 840,731

Int. Cl.⁴ A22C *21/00*

U.S. Cl. 17—46 **17 Claims**



1. A process for deboning poultry which comprises the following steps:

conveying the front half of the bird along a predetermined path on a conveying means wherein the remaining deboning steps are carried out;

severing the joint between each wing and the body of the bird by cutting means such that the wings are not completely severed from the body; and then

gripping the wings of the bird and pulling them away from the body such that the wings and connected breast meat are removed from the body.

4,648,156

METHOD AND APPARATUS FOR REMOVING THE BREAST FLESH FROM A POULTRY CARCASS

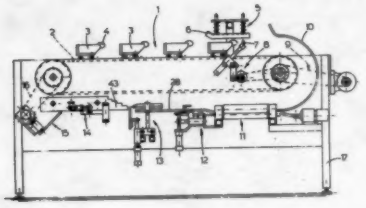
Pieter Meyn, Noordeinde 68C, 1511 AE Oostzaan, Netherlands

Filed Jul. 1, 1985, Ser. No. 751,036

Claims priority, application Netherlands, Jul. 6, 1984, 8402165

Int. Cl.⁴ A22C *21/00*

U.S. Cl. 17—46 **32 Claims**



32. A method fdr removing the breast flash from a poultry carcass, comprising the following steps:

conveying said carcass;

removing the top of the clavicle of said carcass; and

severing the breast flesh from said carcass.

4,648,157

METHOD OF ASSEMBLY OF THE SHELL WITH THE BAND OF A CLAMPING COLLAR, AND COLLARS OBTAINED BY THIS METHOD

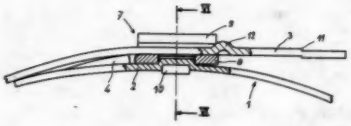
Francis Irio, Chabris; Richard Chene, Mennetou-sur-Cher, and Pierre Uzac, Romorantin Lanthenay, all of France, assignors to Etablissements Caillau, France

Filed Mar. 7, 1984, Ser. No. 587,256

Claims priority, application France, Mar. 10, 1983, 83 03945

Int. Cl.⁴ B65D *63/06*

U.S. Cl. 24—23 R **20 Claims**



1. A method for manufacturing a clamp for pipes, said clamp being comprised of a metallic strap having first and second ends, and an elongated buckle blank having base means for securing said blank transversely on said first end of said strap, said buckle blank including at least one end part projecting from said base transversely of said strap and foldable over said base to form a channel defining, in combination with said base, slot means adapted to receive said second end of said strap, said method comprising the steps of:

cutting said buckle blank base to form at least one elongated tongue portion therein, said tongue extending transversely with respect to said strap when said base is secured thereto;

folding said tongue to a position where said tongue is substantially perpendicular to said base, thereby providing in said base an open recess of a shape corresponding to said tongue, said recess having first and second substantially parallel sides extending transversely with respect to said strap when secured to said buckle base; and

fitting said buckle base over said first end of said strap, folding said tongue beneath said strap and applying on said tongue forces whereby said first end is caused to deform and engage into said open recess and to come into

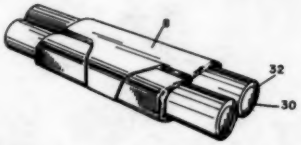
contact with said recess sides, whereby said sides act as longitudinal stops preventing longitudinal movement of said strap with respect to the buckle blank.

4,648,158

CLIP FOR ATTACHING WIRES

Robert West, R.F.D. 1, Box 682, Pownal, Me. 04069

Filed Apr. 24, 1985, Ser. No. 726,725
Int. Cl.[4] B65D *63/06*
U.S. Cl. 24—23 W 2 Claims



1. An improved U-clip for joining coated wires of the type having a top with a first side of said U-clip extending and forming a pair of transversely-spaced prongs having a space defined therebetween and the second side of said U-clip extending substantially parallel to said first side and terminating in a medial prong of a size such that when said U-clip is folded in use, said medial prong fits within the space formed between said transversely-spaced prongs of said first side, said medial prong having space defined on both its sides adapted to receive said transversely-spaced prongs when folded thereupinto, wherein the improvement comprises:

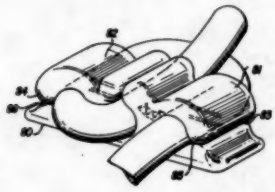
bevelled inside ends of said transversely-spaced prongs and said medial prong, said ends bevelled to taper to a point from the inside of said clip toward the outside of said clip, said bevelled ends adapted to slide by said coating on said wires when installed and being adapted not to dig into or pierce said coating.

4,648,159

FASTENER FOR A LACE OR ROPE OR THE LIKE

John F. Dougherty, 1104 E. "A" St., Yakima, Wash. 98902

Filed Mar. 18, 1985, Ser. No. 713,223
Int. Cl.[4] F16G *11/00*; A43C *7/00*
U.S. Cl. 24—117 26 Claims



1. A device for removably securing a lace or the like molded from a flexible plastic material with memory comprising

a substantially flat base;

a plurality of fasteners integral with and extending above said base, each of said fasteners comprising;

an upper wall;

means integral with said wall and said base for flexibly interconnecting said wall to said base;

a lip at the terminal end of said upper wall extending toward said base;

a ridge extending integrally from said substantially flat base opposite said lip; and

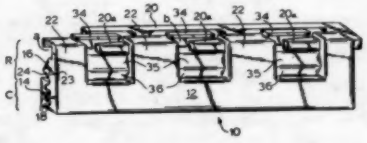
at least one lace penetrating means secured within said means integral with said wall and extending toward said lip.

4,648,160

CLOSURE DEVICE FOR HIGH PRESSURE PACKAGING

Dominic J. Spinosa, Wantagh, and Frank Knoll, Huntington Station, both of N.Y., assignors to East/West Industries, Hauppauge, N.Y.

Filed Apr. 23, 1985, Ser. No. 726,133
Int. Cl.[4] B25B *1/08*
U.S. Cl. 24—515 9 Claims



1. A closure assembly for use in sealing a pressurized package comprising:

two jaw members each said jaw member having a clamping means, a retaining means, and a hinge means between said clamping means and said retaining means, said hinge means adapted to provide hinged connection oriented in a linear clamping direction around which said jaw members pivot between an open position and a closed position, said clamping means having opposed nonplanar mating surfaces for meshing with each other in conforming surface-to-surface relationship in said closed position to substantially hermetically seal an open portion of a pressurized package clamped therebetween, and each said retaining means having at least one interlocking finger transversely offset from the opposed interlocking finger to permit free movement of said fingers past each other when pivoting said jaw members between the open and closed positions, and each said finger having a slot formed linearly therethrough which aligns in the linear clamping direction with said slot in said interlocking finger of the other retaining means to define a continuous passage between said retaining means in said closed position, and

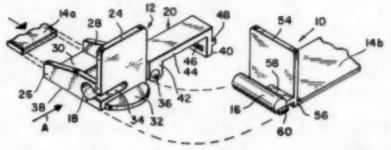
actuation means for passing through said continuous passage formed between said retaining means and maintain said jaw members in said closed position.

4,648,161

JEWELRY CLASP

Max Rosen, 245 Sunnyside Rd., Oceanside, N.Y. 11572

Filed Nov. 18, 1985, Ser. No. 798,868
Int. Cl.[4] A41F *1/04*
U.S. Cl. 24—589 15 Claims



13. A two-part clasp for positioning adjacent the skin of a wearer comprising a female member having a base, a frontal upstanding wall and a pair of side walls straddling said base and extending rearwardly from said frontal wall, a bore extending inwardly from one side wall partially through said base and a slot extending through said frontal wall in communication with the bore in said base, a male member having an upstanding wall having a projection extending laterally across the surface thereof and a prong integral with said projection spaced from said upstanding wall of said male member, said projection and said prong having one end insertable into said slot and bore

from said one side wall to laterally interengage said male and female members to retain the frontal walls of said members in abutment, a substantially U-shaped latch element having one arm hingedly secured to the other side wall of said female member to pivot in a plane containing a central axis of said bore about an axis perpendicular to the abutting frontal walls to a latching position between said clasp and the adjacent skin of the wearer to provide the wearer an indication when said latch element is in its latching position and beneath said female member so that the other arm of said latch element extends over the other side wall of said female member in engagement with the other end of the prong in said bore to prevent separating movement of said male and female members, said latch element being held in its latching position by the adjacent skin of the wearer which feels the displacement of said latch when it disengages from said prong and moves out of its latching position.

4,648,162

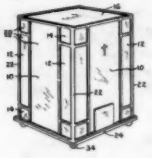
STAINED GLASS CREMATION URN WITH FOAM AND PAPER LINER

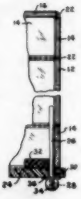
Grant O. Daino, P.O. Box 1827, Cape Coral, Fla. 33910

Filed Apr. 29, 1983, Ser. No. 490,047

Int. Cl.[4] A61G *17/08;* **B44C** *5/08*

U.S. Cl. 27—1 **1 Claim**





1. A cubical cremation urn having a plurality of side wall stained glass pieces having edge aligned surfaces, lead bonding along the edges of the stained glass pieces and having a slight convex contour at the juncture between the pieces of stained glass, a stained glass top assembled with the side wall stained glass pieces and having convex lead bonding between the side wall member and the stained glass top, a plurality of threaded rod members secured to the side wall members, a base having upper inner and lower outer surfaces, said base having apertures through which the threaded rods project, and balls threaded on the rods to clamp the base to the urn, a layer of foam on the upper inner surface of the base to prevent cremation remains from rattling, and a paper liner to prevent the cremation remains from being visible.

4,648,163

METHOD OF MAKING A POLY-V RIBBED PULLEY

Nobuhiro Kayakabe, Toyota; Tadashi Sugiura, Nishikamo, and Hitoshi Sugimoto, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 19, 1985, Ser. No. 766,696

Claims priority, application Japan, Aug. 24, 1984, 59-177289; Aug. 27, 1984, 59-179130

Int. Cl.[4] B21D *53/26*

U.S. Cl. 29—159 R **12 Claims**

1. A method of making a poly-V ribbed pulley, which comprises the steps of:

pressing a cylinder so as to form a first and second flange at each end, respectively, of said cylinder;

pressing a circular plate so as to form a flange;

connecting said first flange of said cylinder to said flange of said circular plate by welding; and

rolling said cylinder so as to form a plurality of V-shaped grooves at an outside surface of said cylinder.

4,648,164

METHOD FOR FORMING AN ENERGY ABSORBING COUPLING FOR A STEERING WHEEL

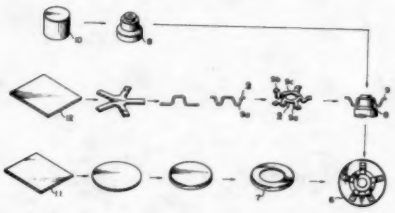
Yoichi Hyodo, Okazaki, and Mitsuru Harata, Nagoya, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Toyoda Cesei Co., Ltd., both of Japan

Filed Sep. 25, 1985, Ser. No. 779,971

Claims priority, application Japan, Sep. 27, 1984, 59-200568

Int. Cl.[4] B21D *53/26*

U.S. Cl. 29—159 B **12 Claims**



12. A method for forming an energy absorbing coupling for connecting a steering wheel to a steering shaft which can absorb impact energy from a force applied to said steering wheel by deforming itself, said method comprising the steps of:

forming a deformable member including a deformable part to absorb said impact energy, a first junction between said steering wheel and said deformable member and a second junction between said steering shaft and said deformable member, said deformable part being formed by blanking a plate thereby producing a blanked piece and then bending said blanked piece into a "U" shape, positioning said deformable part of said deformable member so that it extends in a radial direction of said steering shaft, at least a first end of said deformable part being free during said bending, said first junction being formed from a ring-shaped member, said second junction being formed by machining a block; and

joining said deformable member, said first junction and said second junction to form said energy absorbing coupling.

4,648,165

METAL FRAME (SPRING PULLER)

Gary R. Whiteborne, Rte. #1 Box 668, Glen Allen, Va. 23060

Filed Nov. 9, 1984, Ser. No. 669,881

Int. Cl.[4] B25B *27/14*

U.S. Cl. 29—225 **1 Claim**

1. A hand held tool for removing springs from a metal picture frame wherein the springs between the back and channel of the frame are used to secure works tight in said frame,

said tool comprising,

an elongated shaft with a bend of approximately forty-five degrees, approximately one inch from its outer most tip,

a U-shaped paddle attached to the side of the shaft's outer most end wherein the base of the U-shaped paddle extends transversely approximately ninty degrees from the shaft's outer most tip and wherein the legs of the paddle are fixed to and extend parallel to the outer most end of the shaft, the paddle is further oriented so that when the legs are positioned horizontally the shaft extends upwards at approximately thirty degrees, said legs of said paddle are spaced apart so as to receive the thickness of said springs, further when the legs are in said horizontal position the upper leg is cut back to the shaft at approximately forty-five degrees which allows for encompassing and prying of the springs.

4,648,166

CLAW EXTRACTOR

Paul L. J. Tilman, Rue Ste Anne 59, B-4330 Grace-Hollogne, Belgium

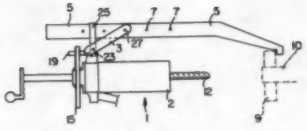
PCT No. PCT/BE84/00018, § 371 Date Mar. 15, 1985, § 102(e) Date Mar. 15, 1985, PCT Pub. No. WO85/00546, PCT Pub. Date Feb. 14, 1985

PCT Filed Jul. 17, 1984, Ser. No. 717,181

Claims priority, application Luxembourg, Jul. 18, 1983, 84921

Int. Cl.[4] B23P *19/02*

U.S. Cl. 29—252 **6 Claims**



1. Claw extractor (1) including a body having a shank therein and having at least three unitary, one piece claws (5) which are designed to hook onto a part (9) to be removed from a shaft (10) while the shank (12) bears against this shaft (10), the claw (5) being connected to the body (2) of the extractor by way of a link (3), the shank being aligned with the longitudinal axis of the extractor and the extractor further including:

guide means (15) which freely rotate about the longitudinal axis of the extractor, but is fixed in translation along said axis, said guide means (15) including closed slots (17) therethrough which permit the simultaneous movement of the claws (5) to be guided by an angular rotation of the guide means about said axis of the extractor; and

said guide means (15) comprising a disk mounted at the rear end of the extractor, said rear end being opposite the extractor end which is adapted to contact the part to be removed (9), said disk (15) incorporating said slots (17) which extend from the center outwardly; received in said slots are slidable stubs (19) fixed to said links (3), the links being articulated on the claws (5) and also connected to the claws by yokes (25) which prevent the free rotation of the claws (5) relative to the links (3), but which permit the claws to slide in the yokes.

4,648,167

ASSEMBLING ROBOT COMPRISING A COLLECTIVE TRANSPORT DEVICE FOR TRANSPORTING PARTS TO BE ASSEMBLED, ASSEMBLING METHOD AND APPLICATIONS THEREOF

Laszlo S. Horvath, Genéve, Switzerland, assignor to C O D Inter Techniques SA, Geneva, Switzerland

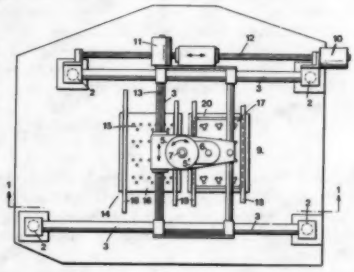
PCT No. PCT/CH84/00131, § 371 Date Apr. 15, 1985, § 102(e) Date Apr. 15, 1985, PCT Pub. No. WO85/01002, PCT Pub. Date Mar. 14, 1985

PCT Filed Aug. 22, 1984, Ser. No. 724,826

Claims priority, application Switzerland, Aug. 26, 1983, 4691/83

Int. Cl.[4] B21D *39/03;* B23Q *17/00;* B23P *21/00*

U.S. Cl. 29—428 **8 Claims**



1. An assembling method for constitutive parts of objects, where said parts are accurately maintained in a working area (9) in predetermined positions and orientations by a positioning device (14) for their manipulation by at least one tool (8) carried by a working head (4) performing movements controlled by a program, characterized in that said parts are disposed before their assembling and outside the working area (99) in a receptable (17) configured to cooperate with the positioning device (14) and to maintain with a certain tolerance said parts in relative positions and orientations similar to those determined by the device (14), the receptacle (22) is transferred to the working area (9) and positioned in such a manner that each part contained in the receptacle comes in direct contact with at least a part of the elements of the positioning device (14), and when required, the receptacle (22) is removed from the working area (9) when the assembling operation is terminated, and further characterized in that the positioning device (14) comprises spaced rigid elements (15) integral with the removable holder (16) constructed to withstand mechanical stresses, said rigid elements (15) being disposed perpendicularly to the sur-

face of the holder (16) and in that the receptacle (17) is provided with holes (21) configured in such a manner that the elements (15) pass through them when the receptable (17) is supported by the holder (16).

4,648,168

OPTICAL FIBRE BREAKOUT

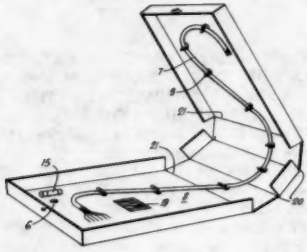
Jean-Marie E. Nolf, Hamme-Mille; Hubert Genbrugge, Wezembeek-Oppem; Valere Buekers, Zelem-Halen; Luiz N. Mendes, Begijnendijk; Jos Doucet, Kessel-Lo, and Jan Vansant, Louvain, all of Belgium, assignors to N.V. Raychem S.A., Kessel-lo, Belgium

Filed Dec. 18, 1984, Ser. No. 684,196

Claims priority, application United Kingdom, Dec. 19, 1983, 8333721; Jan. 30, 1984, 8402355; Jun. 19, 1984, 8415565

Int. Cl.[4] B23P *11/02*; G02B *6/36*

U.S. Cl. 29—447 5 Claims



1. A kit-of-parts suitable for terminating an optical fiber cable having optical fibers disposed cylindrically therearound, comprising: a plurality of protective tubes each suitable for housing individual ones of the optical fibers; a heat-shrinkable sleeve suitable for securing the tubes with respect to the terminated cable; means for identifying respective protective tubes; and means for correlating the identification of the tubes with respective fibers of the cable, the fibers being disposed cylindrically around the cable.

4,648,169

METHOD OF MOUNTING UNIVERSAL MOUNTING BRACKET FOR GAS PUMP TOPPERS

James R. Seely, Rochester, and David U. Hillstrom, Novi, both of Mich., assignors to Marketing Displays, Inc., Farmington Hills, Mich.

Division of Ser. No. 600,825, Apr. 16, 1984. This application Mar. 26, 1986, Ser. No. 825,634

Int. Cl.[4] B23P *19/00*

U.S. Cl. 29—526 R 5 Claims

1. A method of mounting a display device to a fixture comprising:

selecting a cross brace member from a plurality of cross brace members of different lengths, said selection based on the size of said fixture, and wherein each of said cross brace members defines a channel and has attachment means for attaching to said display device and further has a first hole communicating with said channel;

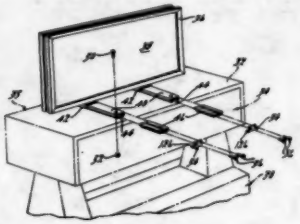
attaching said cross brace member to said display device using said attachment means;

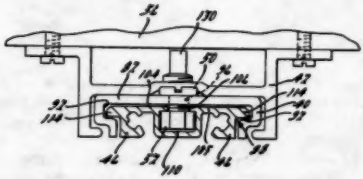
inserting a first threaded fastener through said first hole of said selected cross brace member and threadedly attaching a second threaded fastener to said first fastener without fully tightening;

selecting a slider member from a plurality of slider members of different lengths, said selection based on the size of said fixture, and wherein each of said slider members is adapted for slidably nesting within said channel of said cross brace members and defines an elongated second channel adapted for slidably capturing said second fastener;

sliding said selected one of said slider members into said channel of said selected one of said cross brace members while slidably inserting said second fastener into said second channel to define an adjustable length crosspiece;

positioning said selected cross brace member on said fixture;





attaching a clip member to an end of said slider member;

adjusting the length of said crosspiece by sliding said slider member with respect to said cross brace member so that said clip member engages said fixture; and

tightening said first and second fasteners to one another to prevent further sliding movement of said slider member.

4,648,170

APPARATUS FOR CHANGING THE TOP JAWS OF A CHUCK

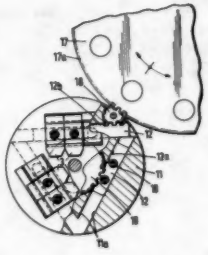
Rainer Kempken, Erkrath; Josef Steinberger, and Johann Ritschel, both of Düsseldorf, all of Fed. Rep. of Germany, assignors to Paul Forkardt GmbH & Co. KG, Düsseldorf, Fed. Rep. of Germany

Filed May 17, 1985, Ser. No. 735,384

Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418553

Int. Cl.[4] B23Q *3/156*

U.S. Cl. 29—568 14 Claims



1. An apparatus for rapidly changing the top jaws of a power-operated chuck having several jaws which are movably guided in a radial direction in a chuck body; each chuck jaw

being formed by a base jaw, and by a top jaw which is exchangeably mounted on said base jaw; after an arresting mechanism has been released, a given top jaw can be removed from its base jaw by a relative movement with respect to the latter; in a normal mounted state, said top jaws being positively fixed in position in the radial direction on their base jaws; said base jaws being provided with guide surfaces for corresponding cooperating surfaces of said top jaws; said changing apparatus can be converted from a rest position into a changing position in front of said chuck; said changing apparatus being provided with guide rails which are adapted to correspond with said guide surfaces of said base jaws, with said guide rails being spaced from one another by a distance corresponding at least to the width of said chuck jaws; said guide rails furthermore representing a continuation, to both sides, of said guide surfaces of said base jaw of that chuck jaw on which said guide rails are placed in the changing position of said changing apparatus; at least one top jaw being supported on said guide rails, and can be exchanged for the top jaw presently on the base jaw by being displaced by a pusher, which is provided with engaging elements; the improvement therewith which comprises:

means for driving said pushers wherein movement is imparted to said means from other than said apparatus; said movement for said means for driving said pushers being derived from a rotary drive mechanism of a tool; derived from a movement of a tool support; derived from another driven structural part of a machine tool, respectively worked-article grabbing device provided therewith; and a common coupling member for interconnecting said pushers.

4,648,171

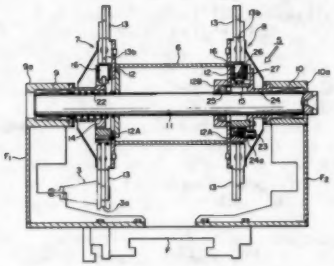
MAGAZINE FOR REPLACEABLE TOOLS AND OPERATION METHOD OF INDEXING TOOLS USING THE MAGAZINE

Hiroshi Yasukawa, Niigata, Japan, assignor to Niigata Engineering Co., Ltd., Tokyo, Japan

Division of Ser. No. 572,347, Jan. 20, 1984, Pat. No. 4,616,397. This application Jan. 13, 1986, Ser. No. 818,422

Int. Cl.[4] B23Q *3/157*

U.S. Cl. 29—568 **9 Claims**



1. A method of indexing a magazine comprising the steps of: transporting a magazine having a plurality of tool holding mechanisms for holding replaceable tools to a machine tool having a spindle; and moving said magazine such that a desired tool is indexed to a predetermined position by engaging tool with the spindle and transmitting movements of said spindle to the magazine through the tool.

4,648,172

MACHINE TOOL FOR HAVING A SPINDLE-HEAD CARRIER AND A SPINDLEHEAD WHICH IS SUPPORTED SWINGABLY THEREON

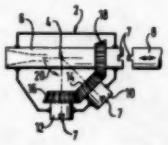
Michael Geiger, Starnberg; Bernd Finsterwalder, and Franz Kagerer, both of Munich, all of Fed. Rep. of Germany, assignors to Friedrich Deckel Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 15, 1983, Ser. No. 466,747

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1982, 3206121

Int. Cl.[4] B23Q *3/157*

U.S. Cl. 29—568 **13 Claims**

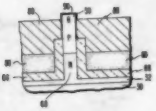


1. A machine tool, comprising: a spindlehead carrier having a drive shaft rotatably supported thereon and a drive motor drivingly coupled to said drive shaft; a spindlehead which is supported on said spindlehead carrier for pivotal movement about a swivel axis which extends transversely to said drive shaft, wherein said spindlehead can be pivotally moved into at least two operational positions and has a working spindle rotatably supported thereon; coupling means for drivingly coupling said drive shaft to said working spindle in each said operational position; and clamping means which is provided within said working spindle and which includes a clamping member biased by resilient means and having an end which projects beyond an end of said working spindle, movement of said clamping member away from an initial position thereof against the urging of said resilient means effecting a release of said clamping means; wherein said spindlehead can also be pivoted into a tool-changing position in which said end of said clamping member is positioned in the region of a stationary operating mechanism which includes selectively actuable means for engaging said clamping member and moving it away from said initial position in order to effect a release of said clamping means; wherein said coupling means includes a stub shaft which is rotatably supported on said spindlehead and has an end which is angularly offset about said swivel axis from an end of said working spindle, said working spindle and stub shaft each having a bevel gear thereon and said bevel gears being in continuous meshing engagement in order to cause said working spindle and stub shaft to rotate simultaneously; wherein said coupling means includes means for drivingly coupling said drive shaft to said working spindle in a first of said operational positions and for drivingly coupling said drive shaft to said stub shaft in a second of said operational positions; wherein said working spindle and said stub shaft are respectively coaxially aligned with said drive shaft in said first and second operational positions; and wherein said coupling means includes said drive shaft being supported for axial movement relative to said spindlehead carrier, axial movement of said drive shaft toward and away from a respective one of said working spindle and stub shaft coaxially aligned therewith causing said drive shaft to be respectively coupled to and decoupled from said one of said working spindle and said stub shaft aligned therewith.

4,648,173
FABRICATION OF STUD-DEFINED INTEGRATED CIRCUIT STRUCTURE

Shashi D. Malaviya, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 28, 1985, Ser. No. 737,745
Int. Cl.[4] H07L 21/20, 21/28
U.S. Cl. 29—576 W 27 Claims



1. A method for forming a narrow dimensioned semiconductor protrusion structure protruding from and integral with a semiconductor body, said method comprising:

providing a semiconductor body of a first conductivity type having a surface region of a second conductivity type;

forming a narrow dimensioned insulator stud having substantially vertical outer walls on said surface region;

anisotropically etching said body using said stud as a mask forming a narrow dimensioned top portion of said protrusion structure, said top portion having substantially vertical walls of said semiconductor material;

forming a first insulating layer on said walls of the stud and the walls of said top portion to obtain a first resulting structure;

anisotropically etching said body using said first resulting structure as a mask forming a relatively wide dimensioned middle portion of said protrusion structure, said middle portion having substantially vertical walls of said semiconductor material;

forming a second insulating layer on the walls of said first resulting structure and the walls of said middle portion to obtain a second resulting structure; and

anisotropically etching said body using said second resulting structure as a mask to completely etch through said surface region and a portion of said body thereunder forming a lower section of said protrusion structure, said lower section having substantially vertical walls of said semiconductor material,

whereby is formed a free-standing and substantially vertical-walled semiconductor protrusion structure integral with said semiconductor body.

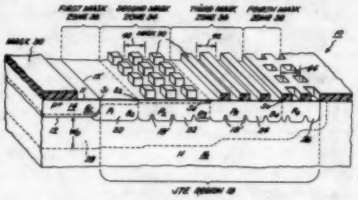
4,648,174
METHOD OF MAKING HIGH BREAKDOWN VOLTAGE SEMICONDUCTOR DEVICE

Victor A. K. Temple, Saratoga, and Wirojana Tantraporn, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 5, 1985, Ser. No. 698,495
Int. Cl.[4] H01L 21/26
U.S. Cl. 29—578 10 Claims

1. In a process of fabricating a semiconductor device including, when complete, at least one reverse-blocking junction, a voltage-supporting region of one conductivity type having an upper surface and forming one side of said junction; and wherein said reverse-blocking junction includes a terminated portion at said upper surface of said voltage-supporting region, and said voltage-supporting region at a location beneath said reverse-blocking junction contains a depletion region width W_D when said junction is reverse-biased to its ideal breakdown voltage, the improvement comprising, in combination with the foregoing:

(a) forming a single mask of not so uniform thickness on said semiconductor device adjacent said terminated portion to be used in forming a junction termination extension region, said step of forming a single mask comprising configuring said mask to expose a percentage x of a first portion of said voltage-supporting region adjacent said terminated portion and to expose a percentage y of a second portion of said voltage-supporting region adjacent said first portion remote from said terminated portion of said reverse-blocking junction, and wherein x is greater than y and adjacent openings in said mask have a center-to-center spacing of less than 0.25 W_D; and



(b) simultaneously doping said first and second portions of said voltage supporting region through said mask with the same concentration of dopant to form in said voltage support region, a first region contiguous with said terminated portion and a second region adjacent said first region, said first and second regions being of approximately the same depth and establishing a junction termination extension wherein the lowermost extent of said junction termination extension is at or below the lowermost extent of said reverse-blocking junction relative to said upper surface of said voltage-supporting layer and each of said first and second regions having a lower dopant dosage per unit volume than any adjacent region more proximate to said terminated portion of said junction.

4,648,175
USE OF SELECTIVELY DEPOSITED TUNGSTEN FOR CONTACT FORMATION AND SHUNTING METALLIZATION

Werner A. Metz, Jr.; Nicholas J. Szluk; Gayle W. Miller; Michael J. Drury, and Paul A. Sullivan, all of Fort Collins, Colo., assignors to NCR Corporation, Dayton, Ohio

Filed Jun. 12, 1985, Ser. No. 743,849
Int. Cl.[4] H01L 21/225
U.S. Cl. 29—589 10 Claims

1. A process for forming a self-aligned, low resistance, ohmic, metal shunted contact and interconnect structure, comprising the steps of:

providing a silicon substrate having doped surface regions;

forming a layer of undoped silicon having a nominal thickness of 50 nanometers or less on the substrate over at least said selected doped surface regions;

patterning the silicon to retain regions of the undoped silicon over the selected doped surface regions;

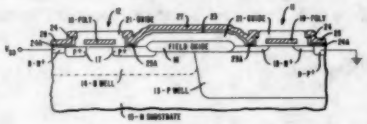
sintering the structure at a lower temperature to updiffuse dopant from the silicon substrate regions into and through the silicon layer overlying the selected doped surface regions of the silicon substrate; and

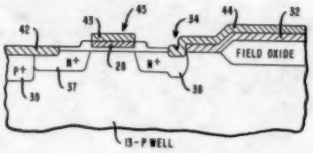
selectively depositing a layer of refractory metal on the silicon to form ohmic contacts between the doped surface regions and the immediately overlying metal layer through the selectively doped silicon.

7. A process for forming an aligned, low resistance, ohmic, tungsten shunted contact and interconnect structure, comprising the steps of:

providing a silicon substrate with exposed regions for making buried contacts and exposed regions for making contacts between the silicon substrate and a silicon interconnect layer;

forming a silicon interconnect layer on the silicon substrate





to cover part of the exposed regions for making contacts between the silicon substrate and a silicon interconnect layer; and

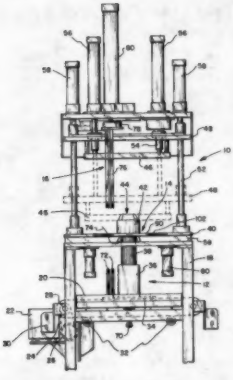
selectively depositing a layer of tungsten on exposed surfaces of the silicon substrate and the silicon interconnect layer to shunt any surface adjacent p-n junctions.

4,648,176

METHOD AND APPARATUS FOR POSITIONING AND TRANSFERRING STATOR COIL LEADS

Keith W. Moser, Roanoke, Ind., assignor to Industra Products, Inc., Fort Wayne, Ind.

Filed May 29, 1985, Ser. No. 738,871
Int. Cl.[4] H02K *15/06*
U.S. Cl. 29—596 **35 Claims**



1. In an apparatus for inserting prewound coils into the coils of a stator core, said slots including at least one coil terminating wire lead, said apparatus including coil insertion means for inserting said coils into said stator core and means for supporting a stator, an assembly for transferring said lead from a predetermined position on said insertion means to a retaining means in said stator core support means, said assembly comprising:

means operatively associated with said insertion means for positioning said lead prior to insertion of said coils into a stator core; and

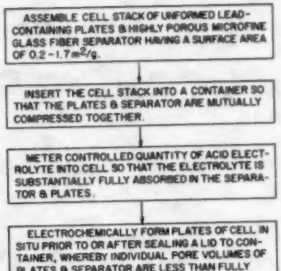
means for transferring said lead from said positioning means to said retaining means.

4,648,177

METHOD FOR PRODUCING A SEALED LEAD-ACID CELL

Toshio Uba, Lakewood, and Robert F. Nelson, Aurora, both of Colo., assignors to Gates Energy Products, Inc., Denver, Colo.

Filed Oct. 21, 1983, Ser. No. 544,333
Int. Cl.[4] H01M *10/12*
U.S. Cl. 29—623.2 **17 Claims**


ASSEMBLE CELL STACK OF UNFORMED LEAD-CONTAINING PLATES & HIGHLY POROUS MICROFINE GLASS FIBER SEPARATOR HAVING A SURFACE AREA OF 0.2 - 1.7 m²/g.
INSERT THE CELL STACK INTO A CONTAINER SO THAT THE PLATES & SEPARATOR ARE MUTUALLY COMPRESSED TOGETHER.
METER CONTROLLED QUANTITY OF ACID ELECTROLYTE INTO CELL SO THAT THE ELECTROLYTE IS SUBSTANTIALLY FULLY ABSORBED IN THE SEPARATOR & PLATES.
ELECTROCHEMICALLY FORM PLATES OF CELL IN SITU PRIOR TO OR AFTER SEALING A LID TO CONTAINER, WHEREBY INDIVIDUAL PORE VOLUMES OF PLATES & SEPARATOR ARE LESS THAN FULLY FILLED WITH ELECTROLYTE.

1. A method for producing a normally sealed gas recombining lead-acid electrochemical cell having absorbed electrolyte, comprising:

assembling a cell stack of electrochemically unformed lead-containing plates and interleaved highly porous microfine glass fiber separator having a surface area of from about 0.2 to about 1.5 m^2/g as determined by the BET method;

inserting the cell stack into a container so that the unformed plates and separator are mutually pressed together;

metering a controlled quantity of acid electrolyte into the cell so that the electrolyte is substantially fully absorbed in the pores of the plates and separator;

electrochemically forming the plates of the cell in situ, whereby individual pore volumes of the plates and separator are less than fully filled with electrolyte; and prior to or after this forming step

sealing the cell.

4,648,178

BALLOON CLIP STAPLER DEVICE

John E. McGrath, 17743 April Ct., Castro Valley, Calif. 94546

Filed Nov. 18, 1985, Ser. No. 799,127
Int. Cl.[4] B23Q *7/10*
U.S. Cl. 29—811 **9 Claims**

1. A device for clamping off a tubular member such as the neck of a balloon with a clip having locking arms joined by a hinge, comprising

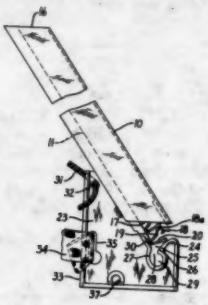
a hollow channel member open at the opposite ends thereof and shaped to accommodate a chain of said clips therein,

a base member secured to said channel member at one end thereof,

said base member having a surface for receiving clips fed out of said one end of the channel member and a stop for said clips, and

means forming a notch in said base member surface between

said stop and said one end of the channel member, said notch being shaped to urge the clamping arms of a clip to



the locked position when moved therethrough with the hinge thereof facing the notch.

4,648,179

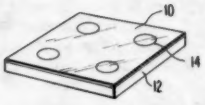
PROCESS OF MAKING INTERCONNECTION STRUCTURE FOR SEMICONDUCTOR DEVICE

Arup Bhattacharyya, Essex Junction, Vt., and Chung Wen Ho, Chappaqua, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,513

Int. Cl.[4] H05K *3/30*

U.S. Cl. 29—832 **10 Claims**



1. In a process of fabricating an electrical interconnection structure for an integrated circuit module, wherein the structure comprises at least one layer of an insulating film carrying conductors for interconnecting metal contact pads in the module or in a semiconductor device which may be attached to the module, the improvement comprising the steps of:

a. temporarily supporting a first flexible thin polymer film on an upper surface of a first support member also having a lower surface and having at least one window therein extending between the upper and lower surfaces;

b. forming a pattern of electrical conductors on the exposed upper surface of said film in an area thereof aligned with said window;

c. coating, through said window, the opposite lower surface of said aligned area of said film with an adhesive;

d. selectively forming vias in the aligned film area opposite some of said conductors; and

e. placing metal-bonding electrically conducting metallurgy in the vias;

so that, when the opposite lower surface of the film is placed in contact with an insulating substrate under heat and pressure, simultaneous bonds are formed through the vias between the conductors on the film and the contact pads on the substrate and between the film and the insulating substrate.

4,648,180

METHOD OF PRODUCING A WIRED CIRCUIT BOARD

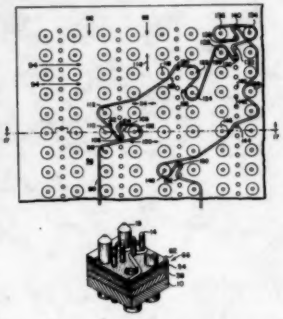
Richard C. Holt, Fairhaven, Mass., assignor to Augat Inc., Mansfield, Mass.

Continuation-in-part of Ser. No. 549,484, Nov. 4, 1983. This application Jan. 29, 1985, Ser. No. 696,151

The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.

Int. Cl.[4] H05K *3/02*

U.S. Cl. 29—847 **12 Claims**



1. A method for producing a wired circuit board comprising the steps of:

routing a continuous insulated wire along a predetermined path through a plurality of pins projecting from a fixture plate;

fastening the continuous wire to a supporting layer to maintain said wire in a fixed position along said path;

mating a circuit board having a plurality of conductive pads disposed on the surface of the board with the wire such that selected points of the wire confront selected ones of the conductive pads; and

interconnecting said selected points of the wire with selected ones of said conductive pads.

4,648,181

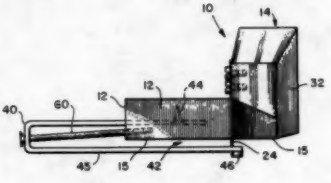
PRECISION LINOLEUM SEAM CUTTING TOOL

Conrad Fortin, 534 Main St., Van Buren, Me. 04785

Filed Jun. 20, 1985, Ser. No. 746,837

Int. Cl.[4] B26B *29/00*

U.S. Cl. 30—293 **20 Claims**



1. A precision linoleum seam cutting tool for cutting the overlying layer of linoleum to be installed next to an underlying layer of linoleum previously installed on a floor comprising:

an elongate tool body constructed and arranged for grasping the tool body and for moving the tool body in the elongate direction with a leading end and a trailing end;

blade means mounted on the tool body and oriented in alignment with the elongate direction adjacent to the trailing end of the tool body;

a pair of spaced apart guides comprising a first aiming guide

mounted adjacent to the leading end of the tool body and a second blade guide mounted adjacent to the trailing end of the tool body;

each guide defining a channel for receiving an overlying layer of linoleum to be cut and installed, each guide comprising edge follower means for abutting against and riding along the edge of an underlying layer of linoleum previously installed for aiming and guiding the tool;

said blade means and pair of guides being arranged on the tool body for cutting a seam edge along the overlying layer of linoleum flush with the edge of the underlying layer of linoleum upon moving the tool with the edge followers abutting against and riding along the edge of the underlying layer;

tool aiming adjustment means comprising a coupling between the aiming guide and tool body for adjusting the aiming guide by moving the aiming guide and aiming guide edge follower back and forth orthogonally across the elongate direction of the tool body for adjusting and straightening the seam cutting direction of the tool;

seam adjustment means comprising a coupling between the aiming guide and tool body for adjusting the blade guide by moving the blade guide and blade guide edge follower back and forth orthogonally across the elongate direction of the tool body for expanding and contracting the seam width.

4,648,182

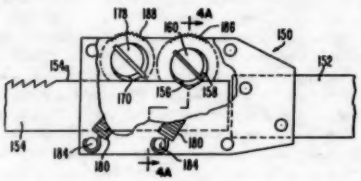
HOLDER FOR SABER SAW BLADE

Simon J. Hoffman, P.O. Box 75821, Los Angeles, Calif. 90075

Division of Ser. No. 628,676, Jul. 6, 1984, Pat. No. 4,594,781, which is a division of Ser. No. 485,767, Apr. 18, 1983, Pat. No. 4,470,196, which is a division of Ser. No. 230,966, Feb. 2, 1981, Pat. No. 4,441,255, which is a division of Ser. No. 62,606, Aug. 1, 1979, Pat. No. 4,285,129. This application Dec. 13, 1985, Ser. No. 808,139

Int. Cl.[4] B27B *19/02*

U.S. Cl. 30—392 **1 Claim**



1. A holder for a saber saw blade comprising: a support having means defining a recess for receiving one end of a saber saw blade, said means including a number of plate elements defining a pair of generally side-by-side slots, one of the slots having a width greater than that of the other slot; and means shiftably mounted on the support for releasably holding the saber saw blade in the recess, the holding means including a rotatably cam member mounted on the outer plate element and having a cam portion movable into an operative position extending into and across the top part of the slots and into a notch of a blade in either of the slots, said spring structure biasing the cam member into said operative position, a second cam member engagable with the edge of the blade with the latter is in the slot, the second cam member being adjacent to the first cam member, there being a thumb wheel on each am member.

4,648,183

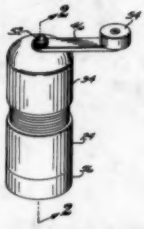
CAN OPENER

Mark D. Jacobs, 2568 Violet St., San Diego, Calif. 92105

Filed Oct. 17, 1985, Ser. No. 788,399

Int. Cl.[4] B24B *19/00*

U.S. Cl. 30—400 **6 Claims**



1. A can opener for removing the top of an aluminum can having an upper rim encompassed by a peripheral crimp in the top, said can opener comprising:

a cylindrical container closed at its base and open at its upper extremity;

an abrasive disk;

a cover mounted to said container and housing said abrasive disk for engagement with a peripheral crimp in the top of a can located in said container whereby rotation of said abrasive disk is operative to abrade said crimp sufficiently to expose the underlying can rim and thereby enable separation of the can top from the can, said cover being movable relative to said container to adjust the height of said disk to maintain continued engagement of the can top by said disk during the abrading operation;

a resilient liner within said container defining a cushioned can cavity for receiving the aluminum can, said liner including a cylindrical portion for substantially coextensive engagement with the cylindrical outer surface of the can, said liner including a base to support the bottom of the can, the resilience of said cylindrical portion enabling said cylindrical portion in its compressed state to engage the can and constrain it against rotation, the resilience of said base enabling said base in its compressed state to urge the can upwardly against said disk; and

means extending through said cover for rotating said abrasive disk.

4,648,184

KEYBOARD CONTROLLED APPARATUS FOR THE IDENTIFICATION OF SMALL PARTS

Alexander Schuir, Hanover, and Franz Schrauder, Litzendorf, both of Fed. Rep. of Germany, assignors to F. Wieland Elektrische Industrie GmbH, Bamberg, Fed. Rep. of Germany

Filed Feb. 13, 1985, Ser. No. 701,069

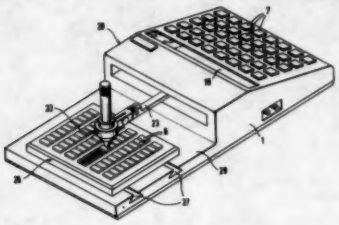
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1984, 3405658

Int. Cl.[4] B43L *13/00;* **B41F** *17/00*

U.S. Cl. 33—18.1 **6 Claims**

1. Apparatus for placing indicia on parts such as electrical components, circuits, terminals and the like comprising a housing, a program-controlled writing device within said housing and having a writing arm extending from said housing, a keyboard on said housing for operatng said writing device such that the keyboard is thereby operable to select the indicia to be applied by said writing device, a console support extending from said housing and generally underlying said writing arm, a frame for receiving said parts, said frame having a plurality of elongated part-receiving openings which are arranged side-by-side in parallel array to form a plurality of rows of said elongated openings, each of said elongated openings receiving an elongated strip of connected parts, support means disposed at

said openings for supporting each elongated strip of connected parts in each of said elongated openings, and slide means on said console support and said frame for slidably supporting said frame on said console support such that the position of said



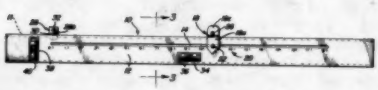
frame is thereby adjustable, said writing arm extending from said housing to generally overlie said frame such that the writing arm is operable to write on said parts sequentially one after the other, whereby indicia is thereby applied to all of said parts on said frame.

4,648,185

LEVELING TOOL

Umberto L. Brandimarte, 5200 D3 Royalton Rd., North Royalton, Ohio 44133

Filed Dec. 26, 1985, Ser. No. 813,559
Int. Cl.[4] G01B *5/14*; G01C *9/26*
U.S. Cl. 33—189 **7 Claims**



1. A tool for marking a pair of points on at least one of a horizontal and vertical line comprising an elongate element having a longitudinally extending guidetrack, a first fixed tab projecting from the elongate member adjacent one end of the guidetrack, the first tab having pivot forming means for the tool associated therewith laterally spaced from the guidetrack for positioning on one of said points, a second projecting tab movable along the guidetrack, releasable locking means for fixing the second tab in selected positions along the guidetrack spaced longitudinally from the first tab a distance corresponding to the distance between said points, means associated with the second tab for a marker located at a lateral distance from the guidetrack corresponding to the lateral spacing of the pivot forming means from the guidetrack, and at least one bubble gauge associated with the elongate element, the elongate member having a front face and a rear edge, the first and second tabs being coplanar with the rear edge and the bubble gauge being exposed for view on the front face.

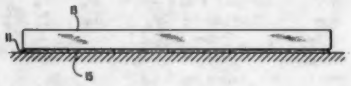
4,648,186

METHOD OF PREVENTING MOISTURE ACCUMULATION AND MILDEW

James Dolman, and Gerri Dolman, both of Rte. 1, Box 354, Cashmere, Wash. 98815

Filed May 15, 1985, Ser. No. 734,180
Int. Cl.[4] F26B *5/16*
U.S. Cl. 34—9 **13 Claims**

1. A method of maintaining bedding of a type susceptible to moisture accumulation and mildew in a dry condition comprising providing a moisture absorbant sheet made of wood pulp unmodified cellulose fiber and formed into said sheet directly from wood pulp, cutting said sheet to conform to the size and shape of the bedding to be kept dry, and placing said sheet



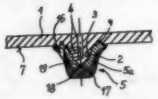
under said bedding in direct contact with said bedding to absorb moisture from said bedding.

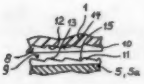
4,648,187

ATHLETIC SHOE SOLE WITH CLEATS HAVING THREADED EXCHANGEABLE GRIPPING ELEMENTS

Armin A. Dassler, and Willi Bauer, both of Herzenogenaurach, Fed. Rep. of Germany, assignors to Puma AG Rudolf Dassler Sport, Fed. Rep. of Germany

Filed Jul. 18, 1985, Ser. No. 756,250
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1984, 3426601
Int. Cl.[4] A43C *15/16*
U.S. Cl. 36—134 **20 Claims**





1. An outer sole for an athletic shoe of the type having cleats with exchangeable grip elements, wherein a cone-shaped threaded stud projects from a bottom surface of the sole and a hollow, tapered screw-on cap is threadingly engageable thereon with a broad base of the cap facing the sole wherein the ground-contacting surface of the sole is provided with an annular recess surrounding the threaded stud, wherein a sole-facing side of said broad base of the cap is provided with an annular flange that is sized, shaped and positioned for reception within said annular recess when said cap is screwed onto said threaded stud, and wherein a ratchet-like locking assembly is provided for securing the cap upon the threaded stud, said locking assembly comprising a first set of locking elements provided within said annular recess which interact with a second set of locking elements formed on said annular flange, the locking elements of said sets of locking elements having run-on surfaces and locking surfaces, said run-on surfaces being less inclined relative to a plane of said bottom surface of the sole than the locking surface.

4,648,188

THREE DIMENSIONAL IMAGE WITH PICTURE COVERING AND FORMING SYSTEM

June L. Blair, 8408 N. 44th St., Omaha, Nebr. 68112

Continuation-in-part of Ser. No. 720,527, Apr. 5, 1985, which is a continuation-in-part of Ser. No. 620,696, Jun. 14, 1984, abandoned. This application Aug. 23, 1985, Ser. No. 768,813
Int. Cl.[4] G09F *1/08*
U.S. Cl. 40—538 **3 Claims**

1. A method of producing three dimensional pictures comprising:

providing a photograph;

removing the backing from the photograph;

producing a picture of the photograph on a pliable film of material;

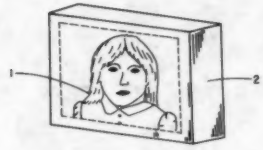
mounting the picture of the photograph which is on the pliable film of material onto a pliable mass of material;

manipulating the pliable mass of material through the picture of the photograph which is on the pliable film of material, using the picture as a guide as to where to sculpture elevations and depressions;

subjecting the manipulated, sculptured, pliable mass of material to a hardening process;

placing the photograph with the backing removed into plastic by a lamination process so that the photograph with the backing removed can be seen through the top plastic covering;

placing the hardened manipulated, sculptured, pliable mass



of material into a "Vacu-Form" machine, on the stage thereof;

simultaneous with the prior step, placing the photograph with the backing removed, which is laminated in plastic, into the "Vacu-Form" machine such that it is aligned with the hardened manipulated, sculptured, pliable mass of material on the stage of the "Vacu-Form" machine;

operatig the "Vacu-Form" machine to heat soften the photograph with the backing removed which is laminated in plastic, and the plastic itself;

further operating the "Vacu-Form" machine to suction pull the heat softened photograph with the backing removed, and which is laminated in plastic, over the hardened manipulated, sculptured mass of material in alignment with said photograph with the backing removed, on the stage of the "Vacu-Form" machine.

4,648,189

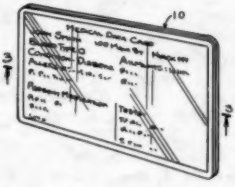
LAMINATED MEDICAL DATA CARD

Thomas J. Michel, Miami, Fla., assignor to Data Medi-Card, Inc., Lake Worth, Fla.

Continuation-in-part of Ser. No. 692,702, Jan. 18, 1985, Pat. No. 4,575,127. This application Nov. 19, 1985, Ser. No. 799,598

Int. Cl.⁴ G09F *13/18*

U.S. Cl. 40—546 **5 Claims**



1. A medical data card in credit card format containing a summary of the medical history of the bearer germane to his existing medical condition, the card comprising:

(A) a core panel adapted to receive external light incident to an edge thereof and having internal light transmitting properties;

(B) a double-faced mirror mounted on one face of the panel whereby the inner face of the mirror abuts said one face of the panel and the outer face of the mirror is exposed to external light;

(C) a front transparency containing medical data in a legible scale mounted on the outer face of the mirror and rendered more readable by external light reflected from the outer face toward the front transparency; and

(D) a rear transparency containing medical data in a legible scale mounted on the other face of the panel and rendered more readable by said internal light reflected toward the rear transparency by the inner face of the mirror.

4,648,190

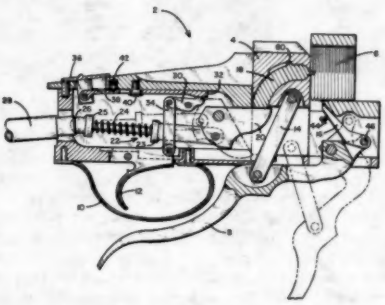
SINGLE SHOT FALLING BLOCK ACTION

Donald L. Allen, White Wood Rd., Sturgis, S. Dak. 57785

Filed Aug. 19, 1985, Ser. No. 766,959

Int. Cl.⁴ F41C *7/06, 11/04, 15/08*

U.S. Cl. 42—23 **6 Claims**



1. A falling breechblock receiver action for a rifle comprising in combination:

a breechblock slidably vertically mounted in a receiver relative to a cartridge receiving chamber, said breechblock having an arcuate first recess formed therein and extending from a lower surface to a side surface adjacent said cartridge chamber and further including a second recess overlapping said first recess over a predetermined portion thereof;

a cocking lever pivotally mounted to said receiver for movement between a rearward position and a forward cartridge eject position, and a linkage arm pivotally coupled at opposite ends to said cocking lever and to said breechblock;

an ejector member pivotally mounted to a fore end of said cocking lever and within a recess formed in said receiver for engaging and rearwardly moving a cartridge from said chamber, upon moving said cocking lever to said cartridge eject position;

an arcuate, gravity mounted firing pin mounted to slide in said first recess and including a projection therefrom contained in said second recess for limiting the path of travel of said firing pin;

a striker pivotally mounted to said receiver and positioned to strike said firing pin upon being released from a cocked position, said striker including a notch formed in an exterior surface thereof for releasably engaging a sear member pivotally mounted to said receiver;

spring means movably mounted in said receiver for biasing said striker toward an uncocked position while maintaining said striker in said cocked position, and for causing said striker to strike said firing pin when released from said cocked position;

a trigger, and a sear link connected to said sear member and said trigger for pivoting said sear member responsive to moving said trigger; and

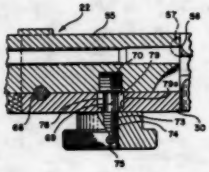
safety means mounted in overlying relation to said sear

member for preventing the release of said sear member from the notch of said striker, thus to retain said striker in said cocked position, when in its safe position and for permitting the release of said striker in its fire position.

4,648,191
RECEIVER AND BARREL COUPLING

Charles W. Goff, 1267 W. 1875 North, Farmington, Utah 84025, and Charles W. Goff, Jr., 479 Laurelwood Dr., Kaysville, Utah 84037

Division of Ser. No. 580,366, Feb. 15, 1984, Pat. No. 4,573,394. This application Nov. 25, 1985, Ser. No. 801,223
Int. Cl.[4] F41C *21/22*
U.S. Cl. 42—75.02 **3 Claims**



1. A coupling arrangement for rigidly connecting together receiver and barrel groups in proper registry with a feed block of a gun comprising, a pin fitted laterally through and between opposite sides of a rectangular shaped receiver, which pin projects upwardly from and across a receiver bottom and is to receive a complementary lateral groove formed in a gun barrel of the barrel group, which groove is forward from a breech end and is to function as a pivot such that when the barrel group is rotated therearound to pivot the barrel breech into the receiver, a radial threaded hole formed in the barrel will align with an opening formed through said receiver bottom the barrel breech end, along opposite sides thereof including identical arcuate grooves formed therein that are open to receive complimentary ears that each extend from opposite sides of a feed block when said barrel group is so pivoted into said receiver, said feed block end thereby being locked to said barrel group in registry with said barrel breech; and a barrel retaining screw maintained in said opening in said receiver bottom that includes a threaded end for turning into said barrel radial threaded hole, to draw the barrel group into position in said receiver, maintaining said feed block therein, and providing points of rigid connection at said barrel retaining screw and said pivot.

4,648,192
FIREARM FOR FIRING AMMUNITION OF DIFFERENT CALIBER

John Harness, Hatton, England, assignor to Hilton Gun Company Limited, England

PCT No. PCT/GB84/00105, § 371 Date Nov. 21, 1984, § 102(e) Date Nov. 21, 1984, PCT Pub. No. WO84/03937, PCT Pub. Date Oct. 11, 1984
PCT Filed Mar. 26, 1984, Ser. No. 678,960
Claims priority, application United Kingdom, Mar. 26, 1983, 8308348; PCT Int'l Appl., Mar. 26, 1984, WO84/03937
Int. Cl.[4] F41C *3/00, 21/10, 21/22*
U.S. Cl. 42—77 **10 Claims**

1. A firearm comprising:

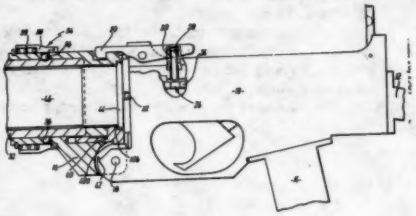
(a) a gun body including a firing mechanism and means mounting a barrel movable between a barrel loading position and a firing position;

(b) means maintaining the firing mechanism inoperative unless the barrel mounting means is correctly in the firing position;

(c) means for releasably mounting a shoulder stock to permit the firearm to be selectively usable in pistol form or rifle form; and

(d) a plurality of barrel parts selectively mountable on said gun body and which include:

(i) a first barrel of a length capable of firing baton rounds and gas rounds, a first insert of a similar length adapted to be fitted from only the end adjacent to the barrel



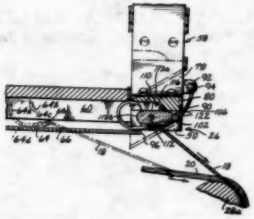
mounting means into the first barrel to provide a smaller calibre barrel;

(ii) a second barrel of a shorter length than the first barrel and capable of firing flare rounds, a second insert of a similar length to the second barrel adapted to be fitted from only the end adjacent the barrel mounting means into the second barrel to provide a smaller calibre barrel.

4,648,193
CIRCLE HOOK BAITER

Wayne E. Alex, Juneau, Ak., and Harold T. Cook, Jr., Bainbridge Island, Wash., assignors to Marco Seattle, Inc., Seattle, Wash.

Filed Apr. 19, 1985, Ser. No. 725,256
Int. Cl.[4] A01K *97/00*
U.S. Cl. 43—4 **23 Claims**



1. An apparatus for baiting a circle hook that includes a shank, a bend, a point bend, and a point, said point being oriented transversely toward said shank, said apparatus comprising:

first means defining a baiting station;

second means for supplying a piece of bait to said baiting station;

third means for drawing a circle hook past said baiting station along a predetermined path and for urging said point into engagement with said bait in a direction transverse to the path-of-travel of said hook; and

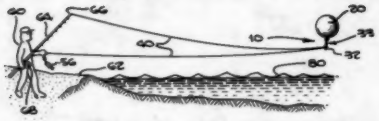
fourth means associated with said baiting station for positioning said bait so that said point is prevented from engaging said bait until said point has been drawn at least past the upstream edge of said bait.

4,648,194

LONG DISTANCE FISHING SYSTEM

Robert Carroll, Jr., 663-½ E. Vernon Ave., Los Angeles, Calif. 90010

Filed Aug. 7, 1981, Ser. No. 290,889
Int. Cl.[4] A01K *91/02*
U.S. Cl. 43—4.5 5 Claims



1. An improved apparatus for fishing at a location in water remote from where the fisherman is positioned on land, under conditions where there is a wind blowing in a direction from the fisherman toward the location where he wants the hook and bait to be located in the water, the improved apparatus to be used with a fishing rod, reel, fishing line, fishing jig, hook and bait, wherein the improved apparatus comprises:

a. a balloon filled with a lighter than air gas;

b. a movable securing means tying said balloon and movably attached to the fishing line at a location between the upper end of the fishing rod and the fishing jig;

c. said movable securing means being capable of longitudinal slidable movement along the fishing line;

d. said balloon filled with a lighter than air gas having sufficient strength to carry said fishing line and said fishing jig over a body of water when said balloon is propelled by a wind while at the same time permitting the bait to remain in the water;

e. a slight wind being sufficient to propel said balloon and movable securing means and enabling said movable securing means to move along said fishing line and to transport said fishing line, jig, hook and bait out over a body of water to a location remote from where the fisherman is positioned on land after the reel is unlocked and the fishing line is able to move freely;

f. said balloon filled with a lighter than air gas being able to float in the air and maintain said hook and bait at the desired location in the water after the reel is locked and the fishing line is no longer able to move freely;

g. said balloon filled with a lighter than air gas being able to float in the air and maintain said hook and bait at the desired location in the water after the propelling wind has ceased;

h. said balloon filled with a lighter than air gas being capable of movement wherein the balloon can carry the line, jig, hook and bait to a more remote location after the reel is unlocked and a wind propels the balloon to a further distance and wherein the balloon can float inward to a location closer to the fisherman when the fishing line is reeled in;

i. said balloon filled with a lighter than air gas and said movable securing means providing a signal to indicate when a fish has taken the bait; and

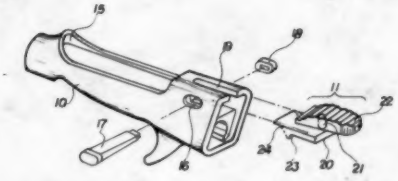
j. said balloon filled with a lighter than air gas so as to enable the caught fish to be easily retrieved by reeling in said fishing line.

4,648,195

FISHING ROD ASSEMBLY

Jin C. Kim, 98-64, Bupyong Dong, Bug-ku, Inchon, Rep. of Korea

Filed Oct. 4, 1985, Ser. No. 784,597
Claims priority, application Rep. of Korea, May 31, 1985, 85-6456[U]
Int. Cl.[4] A01K *87/06*
U.S. Cl. 43—22 4 Claims



1. A fishing rod assembly comprising:

a base frame containing a stationary retainer and a slot disposed on the top portion thereof,

a handle connected to one end of said base frame,

a rod connected to the other end of said base frame,

an aperture extending through said base frame,

gripping means adapted to secure a reel to said base frame, said gripping means containing, as a composite, a gripping plate, a connecting stud, a threaded clamping plate and a groove disposed at the back side of the gripping plate, said gripping means disposed to move forward or backward within said slot, and

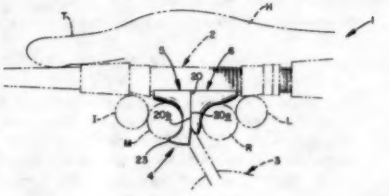
a wedge adapted to slidably engage through said apertures disposed on both sides of said base frame and said groove for locking said gripping means in its forward position whereby the reel is tightly mounted to the fishing rod.

4,648,196

PROTECTED HAND GRIP ASSEMBLY FOR ANGLERS

Dale M. Moody, P.O. Box 55389, Tulsa, Okla. 74155

Filed Nov. 4, 1985, Ser. No. 798,423
Int. Cl.[4] A01K *87/00*
U.S. Cl. 43—23 9 Claims



1. A protected hand grip assembly for anglers, comprising in combination:

a. a casting rod including reel receiving means,

b. a spinning reel assembly including a reel and a rod engaging saddle inserted in said receiving means,

c. a shank member between said reel and said saddle, comprising a vertical portion and an inclined portion,

d. a hand grip area encompassing said rod, said saddle and a portion of said shank member where said shank member engages said saddle, and

e. a finger protector element in said hand grip area surrounding at least substantially the entire vertical shank portion and a portion of the saddle, and having a cushioned and contoured external surface for accommodating an angler's

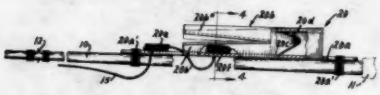
fingers, whereby the angler's fingers never bear against said shank portion.

4,648,197

FISHING LINE HANDLER

Frederick C. Weiberg, Jr., 1225 Brentwood Dr., Evansville, Ind. 47715

Filed Dec. 13, 1985, Ser. No. 808,611
Int. Cl.[4] A01K *89/00*
U.S. Cl. 43—25 **4 Claims**



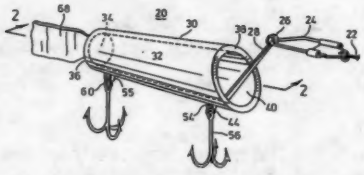
1. A fishing line handler comprising a base disposed on a fishing rod forming a first cutter blade, and a second cutter blade disposed above and parallel to said base and said fishing rod and pivotal on said base by a pin and spring assembly.

4,648,198

FISHING LURE WITH RESILIENT STEM

Laurier Sauve, R.R. #1, Markstay, Ontario, P0M 2G0, Canada

Filed May 14, 1986, Ser. No. 862,957
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.06 **9 Claims**



1. A fishing lure for attachment to a fishing line comprising:

an elongated body having an internal throughpassage which narrows to an aft opening adjacent the rearward end of the body, and which terminates adjacent the opposite forward end of the body in a fore opening;

one or more hook attachment means fastened securely to the body;

one or more hook members connected to the hook attachment means;

a one piece stem member having proximal and distal portions, the proximal portion being secured to the body and having a rigid interface between the proximal and distal portions, said interface being below the horizontal mid-plane of the body and forward of the vertical fore/aft mid-plane of the body;

the distal portion having means for attachment to the fishing line at a position above the horizontal mid-plane of the body and being resiliently deformable such that said distal portion moves generally forwardly and downwardly towards the horizontal mid-plane of the body in response to tensioning of the fishing line.

8. A fishing lure for use in water with a fishing line, said lure comprising:

an elongated body having an internal throughpassage which narrows to an aft opening adjacent one end of the body, and which terminates adjacent the opposite other end of the body in a downwardly-slanted fore opening to the throughpassage;

one or more hook members carried by the body;

a forwardly cantilevered resiliently deformable one-piece stem means having opposed proximal and distal portions;

the proximal portion being rigidly attached to the lure body within the throughpassage at a point below the horizontal mid-line of the body and forward of the vertical mid-line of the body;

the distal portion, in its undeformed rest position, being positioned above the horizontal mid-line of the body fore of the proximal portion and having means for connection to the fishing line;

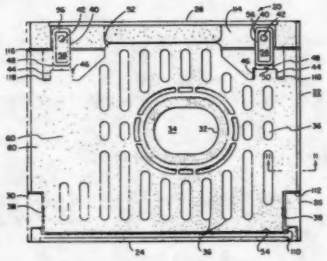
the stem means being resiliently deformable from said rest position such that the distal portion moves downwardly to at least the horizontal mid-line of the body in response to tensioning of the fishing line.

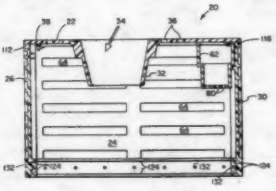
4,648,199

CRUSTACEAN TRAP

Thomas P. Deaton, Mason, Ohio, and Timothy R. Daniels, Marathon, Fla., assignors to Buckhorn Material Handling Group Inc., Milford, Ohio

Filed Aug. 20, 1984, Ser. No. 642,108
Int. Cl.[4] A01K *69/00*
U.S. Cl. 43—100 **18 Claims**





1. A crustacean trap, comprising:

a plurality of substantially planar, monolithic, molded plastic, side panels having first margins including retaining means protruding transversely from the planes of said panels for engaging a base, having side margins disposed along edges transverse to said first margins, and having peripheral margins extending between said side margins;

said side margins including locking means integral to said panels, having channels opening along directions transverse to the planes of said panels and terminating in distal projections;

said locking means of adjacent panels retentively interengaging by assembly movement parallel to said side margins, in coupled pairs and serially interconnecting said plurality of panels as sides of a container, with said distal projections of one channel being within the adjacent channel to be shielded within said channels from the exterior of said container;

said peripheral margins defining a portal providing access to the interior of said container;

a substantially planar, cover panel pivotally positioned within said portal between said plurality of serially interconnected side panels for controlling access through said portal; and

funnel means within said cover panel having an aperture providing limited access into said interior and more limited egress from said interior for crustaceans.

4,648,200

CRUSTACEAN TRAP

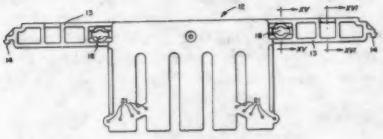
Daniel R. Miller, Cincinnati, Ohio; Timothy R. Daniels, Marathon, Fla., and Thomas P. Deaton, Mason, Ohio, assignors to Buckhorn Material Handling Group Inc., Milford, Ohio

Continuation-in-part of Ser. No. 642,108, Aug. 20, 1984. This application May 16, 1985, Ser. No. 734,851

The portion of the term of this patent subsequent to Mar. 10, 2004, has been disclaimed.

Int. Cl.[4] A01K *69/08, 69/10*

U.S. Cl. 43—102 **22 Claims**



1. A lobster trap, comprising:

a molded bottom rectangular panel, two molded side rectangular panels, two molded end rectangular panels, and a molded top rectangular panel serially connected together to form a rectangular box;

said top panel having a large rectangular inlet opening sufficient to permit crustaceans to freely pass into the interior of the box;

two rigid molded stationary funnel sides of generally planar configuration extending downwardly from said top panel on opposed sides of said inlet opening for a substantial distance into the interior of said box, and said stationary funnel sides being generally vertical and parallel to each other;

two opposed generally planar molded adjustable funnel sides pivotally connected adjacent the top panel about parallel axes that are perpendicular to said stationary funnel sides with said adjustable funnel sides being between said stationary funnel sides so that their lower ends are in the vicinity of the lower ends of the stationary funnel sides, and so that the adjustable funnel sides pivot towards and away from each other to form an adjustable size funnel for guiding the ingress of crustaceans and inhibiting the egress of crustaceans;

a plurality of through apertures in at least one of said stationary funnel sides in an arcuate array concentric with respect to the pivot axis of each adjustable funnel side, respectively, each adjustable funnel side having an aperture spaced from its pivot axis the same distance as the corresponding arcuate array of apertures in the adjacent stationary funnel side for a selective register with the apertures in the adjacent array;

pin means for insertion between aligned apertures in said stationary funnel side and adjustable funnel sides for securing an adjusted position of said funnel;

each of said stationary funnel sides including a top beam extending across said opening and being secured to opposite sides of said top panel to form an opening therebetween for the funnel and at least one additional opening between one of said beams and the adjacent opening end of said top panel, which additional opening is sufficiently large to manually remove crustaceans from said trap; and

a cover removably mounted to close said additional opening.

14. A lobster trap comprising:

a molded bottom rectangular panel, two molded side rectangular panels, two molded end rectangular panels, and a molded top rectangular panel serially connected together to form a rectangular box;

said top panel having a large rectangular inlet opening sufficient to permit crustaceans to freely pass into the interior of the box;

a funnel for guiding the ingress of crustaceans and inhibiting the egress of crustaceans;

opposite vertically extending edges of each of said side and end panels having complimentary vertically extending channels that are assembled through relative vertical sliding motion between adjacent side and end panels; and

said channels are formed by hook shaped flanges that extend only inwardly of the box.

22. A lobster trap, comprising:

a rectangular box having a molded synthetic resin top panel having a large rectangular inlet opening sufficient to permit crustaceans to freely pass into the interior of the box;

two rigid molded stationary funnel sides of generally planar configuration extending downwardly from said top panel on opposite sides of inlet opening for a substantial distance into the interior of said box, and said stationary funnel sides being generally vertical and parallel to each other;

at least one generally planar molded adjustable funnel side pivotally connected adjacent the top panel about an axis perpendicular to said stationary funnel sides with said adjustable funnel side being between said stationary funnel sides so that the adjustable funnel side pivots to form an adjustable size funnel for guiding the ingress of crustaceans and inhibiting the egress of crustaceans;

a plurality of means on at least one of said stationary funnel sides spaced from said pivot axis for selectively securing said adjustable funnel side at a plurality of fixed positions pivoted about said axis;

at least one of said stationary funnel sides including a top beam extending across said opening and being secured to opposite sides of said box to form an opening therebetween for the funnel and at least one additional opening between said beam and the adjacent opening end of said top panel, which additional opening is sufficiently large to manually remove crustaceans from said trap; and

a cover removably mounted to close said additional opening.

4,648,201

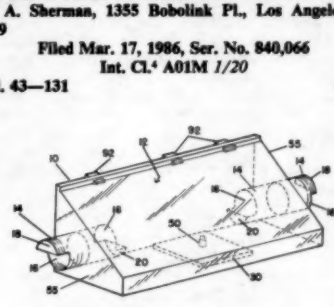
ELONGATED BAFFLED TUNNEL OPENING FOR A RODENT TAMPER-RESISTANT BAIT STATION

Daniel A. Sherman, 1355 Bobolink Pl., Los Angeles, Calif. 90069

Filed Mar. 17, 1986, Ser. No. 840,066

Int. Cl.[4] A01M *1/20*

U.S. Cl. 43—131 **9 Claims**



1. A tamper-resistant rodenticide bait station having a single enclosed compartment that runs parallel with a building wall and is generally constructed as a right angle; said bait station having closed ends with a tunnel structure at each end; said

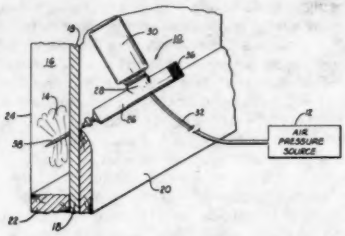
tunnel structure having two baffles, a primary baffle located at an exterior portion of the tunnel structure and a second baffle located on the opposite end and on an interior portion of said tunnel structure; said tunnel being parallel with the compartment; and said tunnel structure having longitudinal sections removed directly opposite and directly adjacent the said baffles that elongates the distance between each opposing wall opening on each side and each respective baffle to allow a larger rodent to enter which allows for minimizing the diameter of the tunnel.

4,648,202

METHOD AND APPARATUS FOR INJECTION APPLICATION OF INSECTICIDE

Lawrence B. Renth, 4825 NW. 75th St., Oklahoma City, Okla. 73132

Filed Sep. 30, 1985, Ser. No. 782,095
Int. Cl.[4] A01M *7/00*
U.S. Cl. 43—132.1 **11 Claims**



1. A method for application of dust insecticide within building structure void spaces, comprising:

inserting a needle having an axial bore and a slot formed near the pointed end through a wall structure into a void space by manual force whereby the needle may be removed to expose only a barely visible puncture mark;

forcing a charge of dust insecticide under air pressure through said axial bore for explusion in said void space; and

repeating the steps of inserting the needle and forcing a charge of dust insecticide a multiple of times at selected intervals along said void space, whereby the total void space is effectively treated.

4. Apparatus for application of insecticide through paneling into building structure void spaces, comprising:

a container including a selected insecticide;

a needle having a hollow bore for effectively non-destructive insertion through said paneling into a void space, said needle including an elongated metal member defining an axial bore that extends from a cap end to proximate a pointed end and having at least one radially aligned, arcuately formed slot communicating with said bore proximate the pointed end;

applicator means receiving a selected amount of insecticide from said container and being in communication with said needle bore; and

a source of air pressure connected to said applicator means to expel said selected amount of insecticide through said needle bore into the void space.

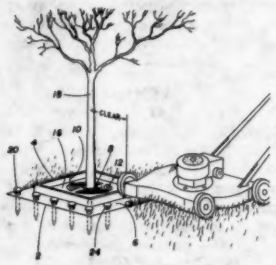
4,648,203

TREE PROTECTOR

Michael Worzek, McMinnville, Tenn., assignor to Feldkircher Wire Fabricating Co., Inc., Nashville, Tenn.

Filed Jul. 23, 1985, Ser. No. 758,037
Int. Cl.[4] A01G *13/02*
U.S. Cl. 47—32 **5 Claims**

1. A tree or plant protector having a generally flat ground engaging base member, a centrally located opening in said base member, a barrier wall integrally mounted on and perpendicular to the base member and positioned between the outer edge of the base member and the edge of the central opening in the base member, a slit in the protector extending from the outer edge of the base to the central opening and continuing on the



other side of the central opening, a plurality of flaps formed in the base member lying within the area formed by the barrier wall and central opening and concentrically arranged with respect to the central opening said slit in the protector base dividing said flaps into pairs of opposing flaps and hinge means connecting each flap to its adjacent flap.

4,648,204

PROCESS FOR FORMING SEEDS CAPABLE OF GROWING HYBRID SOYBEAN PLANTS

William H. Davis, Plainview, Tex., assignor to Ring Around Products, Inc., Prattville, Ala.

Continuation-in-part of Ser. No. 585,940, Mar. 5, 1984, Pat. No. 4,545,146. This application Sep. 24, 1985, Ser. No. 779,647
Int. Cl.[4] A01H *1/02*
U.S. Cl. 47—58 **112 Claims**

1. An improved process for the efficient production of seeds capable of growing male fertile F_1 hybrid *Glycine max* plants comprising:

(a) growing at a location which normally experiences limited natural rainfall when soybean flowering occurs during the summer a substantially uniform population of male sterile soybean plants in pollinating proximity to a substantially uniform population of male fertile soybean plants which when crossed with said male sterile soybean plants enable the formation of seeds on said male sterile soybean plants which are capable of growing male fertile F_1 hybrid soybean plants,

(b) applying water via irrigation to said substantially uniform populations of soybean plants of step (a) as required to promote normal plant growth up to at least the time of the onset of flower formation within each of said populations,

(c) withholding irrigation water from said plants of said substantially uniform populations at a time when flowers are present within each of said substantially uniform populations for a period of time during which no appreciable natural rainfall occurs so as to induce enhanced nectar flow within said flowers which serves to render the flowers more attractive to bees,

(d) crossing said male sterile soybean plants and said male fertile soybean plants with the aid of pollen-carrying bees which are attracted to said enhanced nectar flow whereby seeds are formed on said male sterile soybean plants, and

(e) selectively recovering the seeds which have formed on said substantially uniform population of male sterile soybean plants.

4,648,205

CONSTRUCTION OF DOOR GLASS GUIDE IN MOTOR VEHICLE

Kenzi Ono, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 29, 1985, Ser. No. 717,686

Claims priority, application Japan, Apr. 12, 1984, 59-54031[U]

Int. Cl.[4] E05F 11/38

U.S. Cl. 49—374 20 Claims

1. A construction of a door glass guide in a motor vehicle, wherein a door glass of a three-dimensional curved surface is vertically movably guided, comprising:

slide members each having a spherical head portion and being mounted at least at upper end portions of front and rear end edges of the door glass;

a pair of front and rear guide channel portions provided on a door frame vertically, slidably guiding said slide members, said guide channel portions having longitudinal curvatures substantially equal to respective curvatures of the front and rear end edges of the door glass in the longitudinal section thereof.

4,648,206

WINDOW GLASS RAISING AND LOWERING APPARATUS

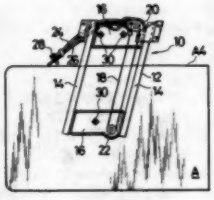
Masaichi Moriya, Chigasaki; Junichi Maekawa, and Takeshi Nakamura, both of Yokohama, all of Japan, assignors to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Filed Dec. 18, 1985, Ser. No. 810,343

Claims priority, application Japan, Dec. 20, 1984, 59-269308; Mar. 30, 1985, 60-67776; Mar. 30, 1985, 60-67777

Int. Cl.[4] E05F 11/48

U.S. Cl. 49—352 8 Claims



1. A window glass raising and lowering apparatus comprising a frame base member comprising a pair of guide rails and a pair of tie brackets for keeping said pair of guide rails parallel to each other, a carrier plate slidably connected to each of said guide rails to support a window glass fixedly connected thereto, a driving section for supplying power to drive at least one of said carrier plates, and a cable means connected between said drive section and said at least one of said carrier plates to transmit said power of said driving section to said carrier plate and said apparatus being adapted to be inserted through a relatively narrow insertion slot into an installation member to which said apparatus is mounted, wherein said driving section is separated from and connected through a pair of generally parallel outer tubes with said frame base member and adapted to be mounted on said installation member for manual operation, said cable means extend through said outer tubes as said cable means travel to and from said driving section, said guide rails are situted along the locus of raising and lowering the window glass, a drive cable from said cable means which runs along one of the said guide rails is connected to said carrier plate through one end of said drive cable, and said drive section having a drive shaft to which shaft a suitable manual driving means is fixed, wherein the thickness of the said frame base member to which all parts are attached is determined by the thickness of the insertion slot of said installation member and the width of the drive shaft of said drive section is also determined by the thickness of the insertion slot.

4,648,207

GLASS RUN FOR AUTOMOBILE DOOR

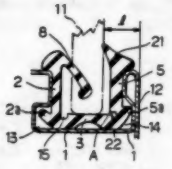
Jun Shibasaki, Ichinomiya, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Sep. 20, 1985, Ser. No. 778,264

Claims priority, application Japan, Sep. 21, 1984, 59-143948[U]

Int. Cl.[4] E06B 7/16

U.S. Cl. 49—441 8 Claims



1. A glass run for an automobile door, which comprises in combination:

(a) a glass receiving groove formed, when said glass run is fitted into a run channel, with an internal lateral wall, a bottom wall, and an external lateral wall in a manner acquiring a cross section roughly in the shape of three sides of a rectangle,

(b) seal parts formed respectively on said internal lateral wall and external lateral wall and adapted to come into contact with the inner and outer surfaces of a glass,

(c) a curved part projected from said internal lateral wall toward the interior of said glass receiving groove so as to urge said glass toward the exterior of the automobile,

(d) a seal part formed of a part extended substantially linearly from said external lateral wall so as to avoid urging said glass toward the interior of the automobile, and

(e) a bending notch formed along the joint between said external lateral wall and said bottom wall in such a manner that a stepped edge on the inner base of said external lateral wall is opposed across a narrow gap to the upper surface of said bottom wall.

4,648,208

DOOR UNIT FOR MOTOR VEHICLES

Haimo Baldamus, Untersieman; Ferenc Szerdahelyi, Coburg; Peter Hess, Coburg, and Manfred Bauer, Ebersdorf, all of Fed. Rep. of Germany, assignors to Brose Fahrzeugteile GmbH & Co. Kommanditgesellschaft, Fed. Rep. of Germany

Filed Mar. 9, 1983, Ser. No. 473,592

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1982, 3209052; May 11, 1982, 3217640

Int. Cl.[4] B60J 5/04

U.S. Cl. 49—502 29 Claims

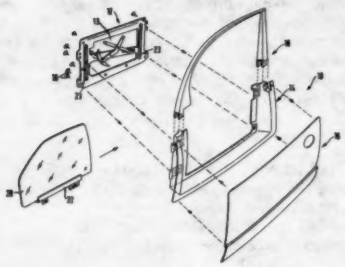
1. A vehicle door comprising

an outer shell,

an inner panel,

a unit carrier means mounted between the outer shell and inner panel and for reinforcing the door and for mounting a window winder means before the assembling of the door,

a door reinforcing element between the outer shell and the inner panel for mounting door hinge parts and locks,



one of window winding mechanism and linkage parts movably mounted to the unit carrier,

wherein the unit carrier is equipped with at least one reinforcing tube, one end of said tube being developed as a base for a hinge and the other tube end of said tube being developed as a base for a lock.

4,648,209

SMALL-SIZED DRILL GRINDING MACHINE

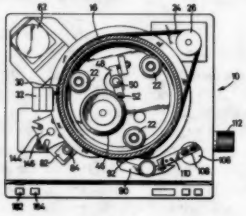
Kazuyoshi Iwata, Nagoya, and Kazuo Fujii, Aichi, both of Japan, assignors to Toyo Machinery Co., Ltd., Aichi, Japan

Filed Oct. 23, 1985, Ser. No. 790,478

Claims priority, application Japan, Apr. 2, 1985, 60-69597

Int. Cl.[4] B24B *3/00, 5/00*

U.S. Cl. 51—90 **15 Claims**



1. A small-shaped drill grinding machine comprising:

(a) a casing;

(b) a turntable having a drill attaching hole at the center and which is supported by said casing and rotatable around a first axial center passing through said drill attaching hole, said turntable having an outer circumferential part;

(c) a table drive device for driving said turntable to rotate;

(d) a chuck device having pawls provided at the center of said turntable which are movable perpendicularly to the first axial center, for grasping the drill using the pawls so that the axial center of the drill coincides with the first axial center;

(e) a grinding wheel having a rotary shaft which is rotatable around a second axial center shifted from but parallel to the first axial center, for grinding a cutting edge at the top end of the drill rotating together with the turntable;

(f) a grinding wheel drive device for driving said grinding wheel to rotate;

(g) a grinding wheel support device provided with a first support member to rotatably support said grinding wheel, a second support member to support said first support member while being movable relative thereto along the direction of the second axial center, and a third support member to support said second support member while being movable relative thereto in a direction perpendicular to the second axial center, for supporting the grinding wheel while allowing said grinding wheel to move to the drill axial center;

(h) a grinding wheel drive lever installed near said grinding wheel support device to be rotatable around a third axial center which is perpendicular to the second axial center when a first end thereof is engaged with the second support member, said grinding wheel driver lever having a threaded portion at a second end thereof;

(i) a first transmission shaft threadedly engaged with the threaded portion of said second end of said grinding wheel drive lever;

(j) a second transmission shaft connected to said first transmission shaft so that it cannot be rotated relative to said first transmission drive shaft but so that it can be moved axially relative to said first transmission drive shaft;

(k) first and second cams installed to contact said outer circumferential part of the turntable;

(l) a first grinding wheel moving mechanism having a first follower to follow said first cam, for converting the movement of said first follower into movement of the first transmission shaft in its axial direction, for correspondingly rotating the grinding wheel drive lever and moving the grinding wheel forward and backward in the drill axial direction, as a result of said first end of the lever being engaged with the second support member and the threaded engagement of the second end of the grinding wheel drive lever with said first transmission shaft;

(m) a second grinding wheel moving mechanism having a second follower to follow said second cam, for converting the movement of said second follower into the relative movement of the second support member perpendicularly to the drill axial center;

(n) an intermittent rotation mechanism including a rotor installed near the turntable and an engaging piece provided on the turntable and rotatable integrally therewith, wherein said rotor is rotated by a certain amount for each revolution of the turntable based on the engagement of said engaging piece with the rotor end during a predetermined portion of each rotation of the turntable; and

(o) a grinding wheel displacement mechanism for converting the rotation of said rotor into the rotation of the second transmission shaft, as a result of which the grinding wheel drive lever threadedly engaged with the first transmission shaft is correspondingly rotated, and the grinding wheel is correspondingly displaced in parallel to the drill axial center to effectively provide drill infeed.

4,648,210

APPARATUS FOR CONTROLLING POSITION OF GRINDING TOOL

Heinz-Josef Reinmold; Horst Mucha, both of Aachen, and Heinz-Dieter Friedrich, Stolberg, all of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Jun. 27, 1985, Ser. No. 749,959

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1984, 3424258

Int. Cl.[4] B24B *49/08*

U.S. Cl. 51—165.77 **12 Claims**

1. Apparatus for grinding the edges of a glass sheet comprising:

a rotary table upon which a glass sheet may be placed,

means for driving the rotary table,

a positioning carriage,

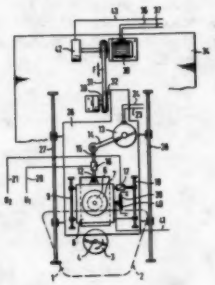
a positioning motor for moving the positioning carriage,

a toolholder mounted on the positioning carriage and movable in a direction toward the rotary table,

a grinding tool mounted on the toolholder,

means for pressing the grinding tool against the edge of the glass sheet with a constant grinding pressure,

at least one pressure measuring device for measuring pressure exerted by the grinding tool against the glass sheet, and



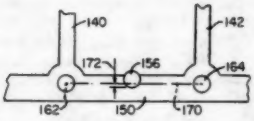
a first distance to voltage converter for determining the relative movement between the toolholder and the positioning carriage, said first converter producing an output voltage which serves as a regulating value for the positioning motor of the positioning carriage.

4,648,211

GRINDING GUIDE AND METHOD FOR CONTROLLING THE AUTOMATIC GRINDING OF OBJECTS

Thomas F. Dawson, Millis, and Paul C. Ewing, Jr., Tewksbury, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Sep. 3, 1985, Ser. No. 772,269
Int. Cl.[4] B24B *49/10*
U.S. Cl. 51—165 R **25 Claims**



1. A guide for the grinding of a surface of a printed circuit board coupon having a test hole to be exposed, comprising:

at least two conductive leads; and

a conductive control track interconnecting said conductive leads and extending across the surface to be ground, at least a portion of the rear edge of said track being precisely located with respect to a predetermined grinding depth of the test hole so that a break in said track occurs with the grinding of the surface to that test hole grinding depth.

4,648,212

AUTOMATIC GRINDING MACHINE

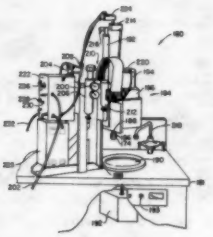
Thomas F. Dawson, Millis; Paul C. Ewing, Jr., Tewksbury; Christos V. Dafnoulelis, Belmont, and Jacob H. Martin, Wellesley, all of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Sep. 3, 1985, Ser. No. 772,267
Int. Cl.[4] B24B *49/10*
U.S. Cl. 51—165 R **33 Claims**

1. A machine for grinding a printed circuit board coupon having a test hole to be exposed and having a plurality of control tracks, each track having at least a portion of the rear edge of the track precisely located with respect to a predetermined grinding depth for the test hole, comprising:

means for engaging the coupon with an abrasive device; and

means, interconnected with the control track on the coupon, for disengaging the coupon and the abrasive device when a break in the track being monitored has been ground, said



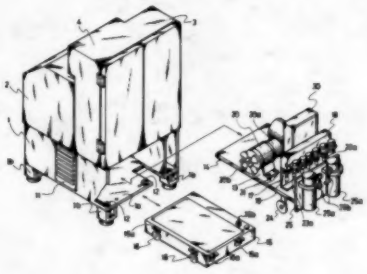
means for disengaging including selector means for successively monitoring the control tracks.

4,648,213

COMPACT GRINDER MACHINE

Tetsuya Nagata, Narashino, Japan, assignor to Seiko Seiki Kabushiki Kaisha, Chiba, Japan

Filed Mar. 28, 1985, Ser. No. 716,955
Claims priority, application Japan, Mar. 28, 1984, 59-44611[U]
Int. Cl.[4] B24B *41/00*
U.S. Cl. 51—166 R **10 Claims**



1. A compact grinder machine having an oil-driven mechanical base supported by a frame for processing a workpiece, the compact grinder comprising: an oil unit detachably connected to the mechanical base for supplying pressurized oil to drive the mechanical base; a cooling unit disposed adjacent to the oil unit for cooling the oil unit; supporting means slidably insertable into and withdrawable out of the frame and supporting thereon the oil unit and the cooling unit; and an oil tank slidably insertable into and withdrawable out of the frame independently of the supporting means and detachably connected to the oil unit for supplying oil to the oil unit.

4,648,214

CRYOGEN SHOT BLAST DEFLASHING SYSTEM

John J. Brull, and Robert E. Schmitz, both of Chagrin Falls, Ohio, assignors to AGA Ab, Sweden

Filed Oct. 28, 1983, Ser. No. 546,431
Int. Cl.[4] B24C *3/04*
U.S. Cl. 51—410 **20 Claims**

1. A cryogen shot blast deflashing apparatus, comprising:

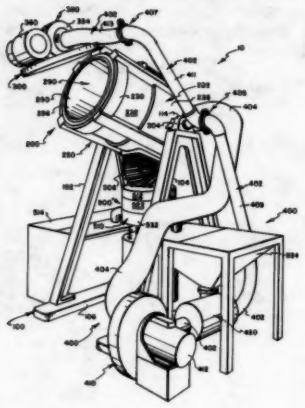
(a) receptacle means including a drum-like container defining a treatment chamber for receiving workpieces to be deflashed and for rotating about an axis, frame means for supporting the container for rotation about said axis rela-

tive to the frame means, and drive means for rotating the container about said axis relative to the frame means to impart movement to workpieces contained within the treatment chamber;

(b) throwing wheel means for receiving a supply of particulate media and a flow of cryogen gas, for propelling media into the treatment chamber to impact workpieces which are being moved about within the treatment chamber, and for introducing a relatively high velocity flow of cryogen gas into the treatment chamber;

(c) cryogen supply means for introducing a flow of crygen into the treatment chamber for embrittling at least selected portions of the contents of the treatment chamber;

(d) cryogen recirculation means for withdrawing cryogen gas from the treatment chamber and for redelivering cryogen gas to the throwing wheel, the cryogen recirculation means including return conduit means for withdrawing cryogen gas from the treatment chamber, and supply conduit means for redelivering pressurized cryogen to the



throwing wheel means, and a blower connected to the return conduit means for assisting in the withdrawl of cryogen gas from the treatment chamber and for pressurizing the withdrawn cryogen gas for return to the treatment chamber through the supply conduit means and the throwing wheel, whereby the blower and the throwing wheel means cooperate to establish a high velocity flow of cryogen gas through the treatment chamber to establish a high cooling rate which facilitates rapid embrittlement of workpiece flash; and,

(e) media supply means for introducing a metered flow of particulate media into the flow of cryogen gas which is delivered to the throwing wheel means during operation of the apparatus, the media supply means including particulate media recirculation means for withdrawing reusable media from the treatment chamber and for introducing a metered flow of such withdrawn media into the supply conduit flow of pressurized cryogen gas to transport the same therewith to the throwing wheel means.

4,648,215

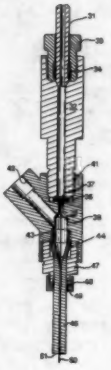
METHOD AND APPARATUS FOR FORMING A HIGH VELOCITY LIQUID ABRASIVE JET

Mohamed A. Hashish, Kent; Michael J. Kirby, Vashon, and Yih-Ho Pao, Bellevue, all of Wash., assignors to Flow Industries, Inc., Kent, Wash.

Continuation of Ser. No. 701,460, Feb. 14, 1985, abandoned, which is a continuation of Ser. No. 436,002, Oct. 22, 1982, abandoned. This application Oct. 7, 1985, Ser. No. 786,136

Int. Cl.[4] B24C *5/04*

U.S. Cl. 51—439 **24 Claims**



1. A method for producing an abrasive laden jet of high velocity liquid within a pressure range of about 5000–100,000 p.s.i. at the output of a jet producing apparatus, said method comprising the steps of:

generating a jet of high velocity liquid; and

introducing particles of abrasive into said jet; and,

orienting said particles velocity vector to that of said jet; and

accelerating said particles through a nozzle arrangement having a downstream-most continuous straight walled cylindrical passageway section which defines an outlet end serving as said output to a speed of at least about 80% of that of said jet as the jet exits the apparatus output and imparting to said particles a component of movement toward the center of said jet sufficient to concentrate said particles at the jet's center as the jet exits said apparatus output, said straight walled passageway section of said nozzle arrangement having a length which is between about 25 and 100 times it's diameter so as to impart said speed to said particles and concentrate them in the center of the jet.

4,648,216

PREFABRICATED BUILDING

Lloyd L. Reaves, Sioux Falls, S. Dak., and John K. Dawick, Miami, Fla., assignors to Gang-Nail Systems Inc., Miami, Fla.

Filed Jul. 26, 1983, Ser. No. 517,333

Int. Cl.[4] E04B *1/32;* E04C *3/02*

U.S. Cl. 52—90 **34 Claims**

1. A building constructed with prefabricated components comprising:

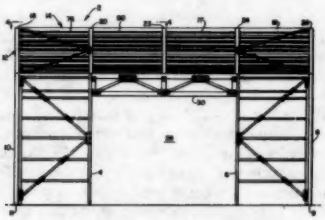
front, back and side wall structures;

a plurality of prefabricated braced frame structures used in forming at least portions of said walls of said building constructed with prefabricated components, each of said braced frame structures having a series of lateral wooden frame members interconnecting two longitudinal wooden frame members and a built-in wooden frame cross-bracing member extending in between said lateral wooden frame members, and a plurality of metal connector plates inter-

connecting said wooden members, said connector plates having teeth struck out from such plates and embedded into said wooden members; said wooden frame cross-bracing member in said braced frame structures being constructed so as to be formed by a series of wooden sections extending between said lateral frame members with the ends of said wooden sections abutting the sides of the respective adjacent said lateral frame members and each of said wooden sections being interconnected with adjacent wooden sections and respective said lateral frame members by said metal connector plates so that said wooden sections form said frame cross-bracing member extending between said longitudinal frame members with each of said wooden sections having one of its sides lying substantially within the same plane as a side of said lateral frame members so as to provide said braced frame structure with a flat outer surface;

a plurality of prefabricated roof truss structures arranged on top of said walls and being approximately equally spaced from each other; and

a plurality of prefabricated purlin structures arranged between and connected to said roof truss structures with at



least several of said purlin frame structures having a plurality of lateral wooden purlin members interconnecting two longitudinal wooden purlin members and a built-in wooden purlin cross-bracing member extending in between said lateral wooden purlin members, and a plurality of metal connector plates interconnecting said wooden members, said connector plates having teeth struck out from such plates and embedded into said wooden members; said wooden purlin cross-bracing member in said purlin structures being constructed so as to be formed by a series of wooden sections extending between said lateral purlin members with the ends of said wooden sections abutting the sides of the respective adjacent said lateral purlin members and each of said wooden sections being interconnected with adjacent wooden sections and respective said lateral purlin members by metal connector plates so that said wooden sections form said purlin cross-bracing member extending between said longitudinal purlin members with said wooden sections having one of its sides lying in substantially the same plane as a side of said lateral purlin members so as to provide said purlin structure with a flat outer surface.

4,648,217

EXPANSION ROOF

Vincent O. Watson, 705 Washington St., Dedham, Mass. 02026

Continuation of Ser. No. 471,642, Mar. 3, 1983, abandoned. This application Sep. 3, 1985, Ser. No. 771,189

Int. Cl.[4] E04B 7/02

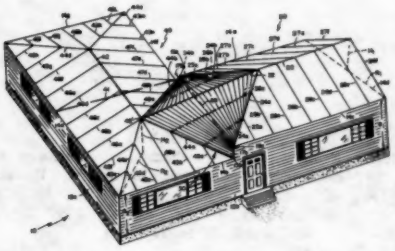
U.S. Cl. 52—90 **16 Claims**

1. A roof structure comprising: means for providing a frame to connect a pair of adjacent roofs, said means comprising:

a first pair of hip rafters of a first one of said roofs, each hip rafter of said first pair of hip rafters having a first end and a second end, said first ends being connected together at first common point, with said first common point being disposed in elevation over the second ends of said first pair of hip rafters;

a second pair of hip rafters of a second one of said roofs, each hip rafter of said second pair of hip rafters having a first end and a second end, said first end being connected together at a second, different common point, with said second common point being disposed in elevation over the second ends of said second pair of hip rafters;

a ridge board member connected between the common points of each pair of hip rafters; and



wherein the second end of each hip rafter of said first pair of hip rafters is disposed adjacent to the second end of a corresponding hip rafter of said second pair of hip rafters with said ridge board member being disposed in elevation over the second ends of said hip rafters, and with each hip rafter of the first pair diverging away from the corresponding hip rafter oif the second pair beginning at the adjacently disposed second ends of said pairs of hip rafters.

4,648,218

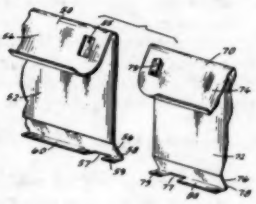
INTERLOCKING ROOF EDGE FASCIA SYSTEM

William J. Butzen, N57 W15167 Mesa Dr., Menomonee Falls, Wis. 53051

Filed May 31, 1985, Ser. No. 739,663

Int. Cl.[4] E04B 7/00

U.S. Cl. 52—96 **3 Claims**



1. In a roof edging mechanism for providing a dam at the edge of a roof and for securing the edge of a rubber membrane overlying the roof in place, said roof edging mechanism having a dam means adapted to be secured to the edge of the roof and a fascia for covering at least a portion of said dam means and for clampingly engaging said rubber membrane, the improvement comprising a fascia having a plurality of fascia members wherein each fascia member has a first and second end, a vertical portion having an upper and lower edge extending between said ends, and an inclined spring portion extending downwardly from said upper edge between said first and second ends, and means for expansibly interlocking said fascia members, said interlocking means including an outwardly extending fin member located at the inclined spring portion of said first end, an opening located at the inclined spring portion of said second end, said first end fin member adapted to be received by and interlockingly engaged with said second end

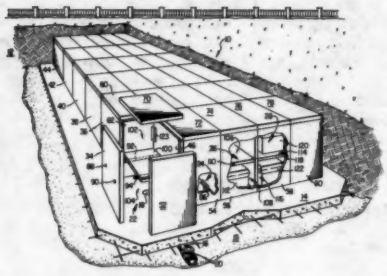
opening, a first notch and first lip member located at the lower edge of said first end and a second notch and second lip member located at the lower edge of said second end, said first end lip member adapted to be received by and interlockingly engaged with said second end notch and said second end lip member adapted to be received by and interlockingly engaged with said first end notch, whereby contiguously overlapping fascia members are expansibly interlocked.

4,648,219

LAWN CRYPT

Franklin R. Johnston, Sr., Waxahachie, Tex., assignor to Memorial Management and Marketing Concepts, Inc., Waxahachie, Tex.

Filed May 16, 1984, Ser. No. 610,797
Int. Cl.[4] E04H *13/00*
U.S. Cl. 52—131 **15 Claims**



1. An underground burial crypt constructed to support heavy mechanized equipment performing cemetery operations at ground level, comprising:

a reinforced concrete slab located below ground level,

means for draining water from the vicinity of said slab,

an array of contiguous chambers formed by:

(i) a plurality of load bearing side panels supported on said slab,

(ii) a plurality of load bearing end panels supported on said slab,

(iii) a plurality of load bearing top panels,

each of said panels being formed individually of reinforced concrete, and each of said chambers defined by two opposing and upstanding ones of said side panels, two opposing and upstanding ones of said end panels and one of said top panels supported by said two opposing side panels and said two opposing end panels, each said end panel joined to at least two of said side panels along respective edges of said end panel, wherein adjacent ones of said chambers share either one of said side panels or one of said end panels, each of said chambers capable of supporting the weight of at least 16,000 lbs., the top panels of adjacent ones of said chambers sharing a side panel, each top panel resting on a portion of a top edge of the side panel so that the side panel directly supports both top panels, the top panels of adjacent ones of said chambers sharing a common end panel also each being supported on a portion of a top edge of the end panel so that the end panel directly supports both top panels.

4,648,220

SUPPORTING MEMBER

Sven R. Gebelius, Drottningholmsv. 195, Bromma, Sweden (S-16136)

PCT No. PCT/SE83/00342, § 371 Date May 28, 1985, § 102(e) Date May 28, 1985, PCT Pub. No. WO85/01535, PCT Pub. Date Apr. 11, 1985
PCT Filed Sep. 29, 1983, Ser. No. 740,061
Int. Cl.[4] E02D *27/00*
U.S. Cl. 52—155 **8 Claims**

1. A supporting member for penetration into a foundation by subjection to a substantially linear driving force, comprising:

a plurality of frustoconical tubular bodies, each one of said bodies having an upper end and a lower end; each of said frustoconical tubular bodies having a central axis and a wall; each said wall being initially corrugated at least in the vicinity of said lower end which is adapted to expand outwardly at said lower end during insertion into a foundation; each said lower end having a bottom edge; each said bottom edge being initially corrugated;

each said frustoconical tubular body having an undeformed condition and a deformed condition, wherein said deformed condition is caused by forcible insertion of said lower end of said frustoconical tubular body into a foundation;

in said deformed condition, said lower end being expanded outwardly so as to present a substantially larger projected area transverse to said axis than in said undeformed condition and said bottom edge having substantially no corrugations; whereby the driving force is resisted at least partly due to tensile strength in said wall adjacent said bottom edge;

said plurality of frustoconical tubular bodies including at least three said frustoconical tubular bodies, two of said at least three bodies being disposed generally concentrically about a first one of said at least three bodies;

whereby said frustoconical tubular body is deformed from said undeformed condition during penetration of said lower end into the foundation, with resistance to the driving force increasing sharply when said deformed condition is reached.

4,648,221

DEVICE FOR FASTENING AN ADDITIONAL PANE IN A WINDOW

Alf Häggqvist, Värnamo, Sweden, assignor to AB Varnamo Gummifabrik, Värnamo, Sweden

Filed Jan. 26, 1984, Ser. No. 574,239
Claims priority, application Sweden, Jan. 28, 1983, 8300437
Int. Cl.[4] E06B *3/28*
U.S. Cl. 52—202 **2 Claims**

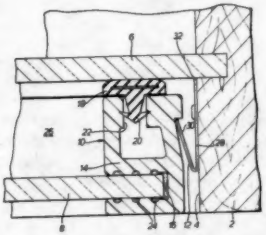
1. A device for fastening an additional glass panel into a window opening of a window frame comprising:

a strip arrangement having a base portion and a top portion, said base portion adapted to receive peripheral edge portion of the additional glass panel said top portion comprising a shoulder;

a sealing member connected to said top portion of said strip

arrangement and adapted to sealingly engage an existing glass panel previously mounted in the window opening,

a plurality of fastening elements for retaining said strip arrangement and said additional glass panel supported thereby in the window opening; said fastening elements comprising a retainer portion and a leg resiliently connected to said retainer portion at its lower end, said retainer portion being secured to an inner surface of the window frame, and comprising at its upper end an engagement portion adapted to contact the existing glass panel, said leg being adapted to snap into a position behind said shoulder on said strip arrangement; wherein contact of the engagement portions with the existing glass panel defines the position of the legs of the fastening elements on said strip arrangement so that the legs snap into said position behind the shoulder of the strip arrangement in a position thereof in which the sealing portion sealing engages the existing glass panel.



4,648,222

MOUNT STRUCTURE OF A WINDOWPANE FOR AUTOMOBILE USE

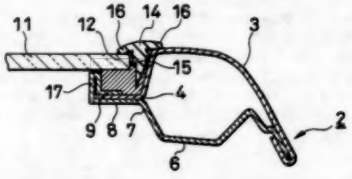
Toshimi Miyata, Irumi; Toshiki Takahashi, Asaka, and Kenji Matsumoto, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1985, Ser. No. 796,334

Claims priority, application Japan, Dec. 19, 1984, 59-191481[U]

Int. Cl.⁴ E06B *3/00*

U.S. Cl. 52—208 **3 Claims**



1. A mount structure of a windowpane for automobile use of the type that the windowpane is directly mounted, with the aid of adhesive material, to the outdoor of a window frame portion of a vehicle body, which window frame portion is formed by superposing a flange portion of an outer panel and a flange portion of an inner panel on each other, characterized in that the flange portion of said inner panel is folded back from the indoor side towards the outdoor side so as to form a dam portion projecting outwards, whereby outflow of said adhesive material can be prevented by said dam portion, and an outdoor side portion of the flange portion of said inner panel is superposed on an indoor side portion of the flange portion of said inner panel, and the edge of the flange portion of said outer panel is pinched between the indoor side portion and the outdoor side portion of the flange portion of said inner panel to form a three ply juncture.

4,648,223

CONCRETE STRUCTURE, BLOCK FOR MAKING SUCH STRUCTURE AND METHOD OF MAKING SUCH STRUCTURE

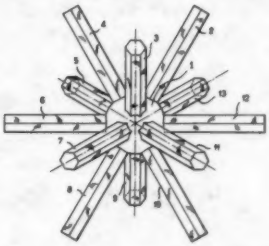
Pierre Richard, Neuilly, France, assignor to Bouygues, Clamart, France

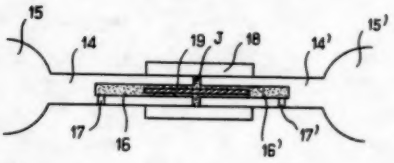
Filed Dec. 11, 1984, Ser. No. 680,545

Claims priority, application France, Dec. 14, 1983, 83 20092

Int. Cl.⁴ E04G *7/20*

U.S. Cl. 52—223 R **11 Claims**





1. A concrete structure comprising: a plurality of prefabricated cast concrete blocks, each block having a node and a plurality of arms radiating outwardly from the node, each of said blocks interconnected with a plurality of others of said blocks at connections between outer free ends of respective ones of said arms to define a rigid, three-dimensional lattice, each arm having at least one longitudinal socket defined by an opening in the free end of the arm, connected arms being joined in pairs in axially aligned relationship to define bars of the lattice, the sockets of assembled arms being in alignment, a metal reinforcing member received in each one of a pair of aligned sockets, the connections of the arms surrounded by a sealing sleeve, said sockets being filled with hardened mortar to securely join the arms to the reinforcing member, and prestress cables passing outside the bars of the lattice and fixed at ends of the cables to nodes of the lattice to prestress the structure.

4,648,224

TENDON FOR PRESTRESSED CONCRETE

Toshiyuki Kitta, Omiya; Hiroshi Tada, Yokohama, and Keizo Ishikawa, Yamato, all of Japan, assignors to Japanese National Railways and Oiles Industry Co., Ltd., both of Tokyo, Japan

Filed Mar. 15, 1985, Ser. No. 712,096

Claims priority, application Japan, Mar. 28, 1984, 59-058389

Int. Cl.⁴ E04C *3/10*

U.S. Cl. 52—223 R **3 Claims**

1. A tendon for pretensioning a concrete structure, comprising:

a rod-like or linear tendon formed of fiber reinforced plastic

covered by a plastic adhesive layer, said adhesive layer on its outer surface having a dense and uniform mass of

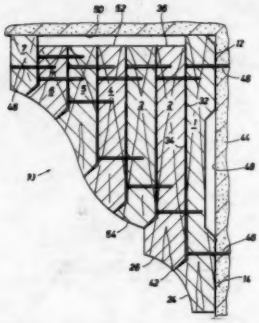
inorganic particles of a particle size ranging from 300 μm–1000 μm partially embedded therein.

4,648,225

SPLIT BENDING CROWN MOLDING

Thomas T. Waddell, 2515 Valleyview Ct., Sugar Land, Tex. 77479

Filed Jun. 7, 1985, Ser. No. 742,725
Int. Cl.[4] E04F *19/02*
U.S. Cl. 52—288 **15 Claims**



1. A split bending molding assembly for use in curved and straight walled building structures, comprising:

(a) a plurality of molding strips which are assembled to the interior corners of intersecting straight and curved building surfaces and are bent to substantially fit the profile thereof to form an interior corner molding of desired decorative configuration, each molding strip forming a decorative surface segment;

(b) cooperative cam surface means being formed by each adjacent pair of said molding strips and forming a tapered relation converging toward said decorative surface segment, upon movement of one of said molding strips relative to an adjacent molding strip in a direction substantially parallel to one of said building surfaces said cooperative cam surface means having camming reaction with one another for inducing precision alignment of said decorative surface segments of said adjacent molding strips.

4,648,226

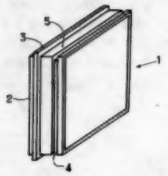
GLASS ELEMENT, NOTABLY GLASS BLOCK OR TILE

Gérard Manon, 2, rue Notre-Dame, 54740 Ormes, France

Filed Nov. 29, 1983, Ser. No. 555,953
Claims priority, application France, Mar. 9, 1983, 83 03982
Int. Cl.[4] E04C *1/42*
U.S. Cl. 52—308 **6 Claims**

1. A building element adapted to be interfitted with other building elements positioned adjacent thereto, which comprises:

a block formed of glass, the glass block having a median plane and including peripheral sidewalls, each of said sidewalls being formed in three successive surface levels, each sidewall including a rib projecting therefrom and situated on one side of the median plane of the block, a recess formed therein and situated on the opposite side of the median plane of the block, and an intermediate level, central support surface interposed between the rib and the recess for supporting an adjacent block thereon, each rib of each sidewall having equivalent dimensions and each



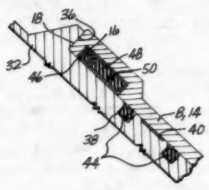
recess formed in each sidewall having equivalent dimensions, each rib and recess of the glass block being dimensioned to be received by and to receive a corresponding recess and rib of an adjacent block.

4,648,227

LOW SHOCK EXPLOSIVE JOINT SYSTEMS

David C. Reusch, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 23, 1985, Ser. No. 779,246
Int. Cl.[4] F42B *15/10*
U.S. Cl. 52—419 **20 Claims**



13. A method of attaching a structure having a flange to another structure and of releasing said structures from each other without creating high shock pulses that could damage said structures, said method comprising:

adhesively bonding said flange to said other structure by applying a layer of adhesive between a side surface of said flange and a surface of said other structure;

positioning an expandable member between said surfaces and, in a direction parallel to said surfaces, between an outer end of said flange and said layer; and

expanding said member perpendicular to said surfaces, to peel said flange away from said other structure to peel said layer and thereby release said structures from each other.

4,648,228

MODULAR STRUCTURE, STUD THEREFOR, AND METHOD OF CONSTRUCTION

Donald L. Kiselewski, 4705 Holly Dr., Palm Beach Gardens, Fla. 33410

Division of Ser. No. 470,160, Feb. 28, 1983, Pat. No. 4,551,961.
This application Sep. 11, 1985, Ser. No. 774,663
Int. Cl.[4] E04B *2/00*
U.S. Cl. 52—426 **24 Claims**

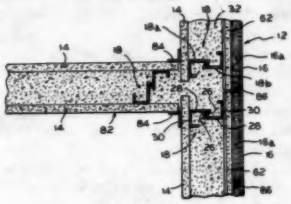
1. A modular structure, comprising:

a wall formed of an inner and outer panel, said inner and outer panels defining a cavity therebetween;

at least one perforated stud disposed between said inner and outer panels, one of said panels being secured to a first portion of said perforated stud and the other of said panels being secured to a second portion of said perforated stud,

said first and second portions including respective engagement means and being relatively movable; and

means for permanently interlocking and encasing said first and second portions of said perforated stud in a fixed



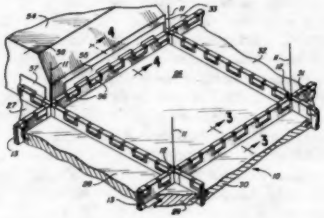
position within said cavity in concrete such that said inner and outer panels of said wall are maintained in spaced apart relationship by a preselected distance to form a rigidized modular structure.

4,648,229

SUSPENDED CEILING SYSTEM HAVING TILES WITH INTERSPERSED HOOKS RESTING ON RUNNERS

Edgar W. Limp, 1103 E. Campbell, Arlington Heights, Ill. 60004

Filed Mar. 7, 1983, Ser. No. 473,106
Int. Cl.[4] E04B 5/52
U.S. Cl. 52—484 **31 Claims**



1. A suspended ceiling system for a room comprising:

(A) an elongated support member having a first end and a second end;

(B) suspension means for retaining said support member at a predetermined height above the floor of said room;

(C) first and second ceiling components located adjacent to and, at least in part, at the same location along said member, said first component, at said location, being on one side of said member and said second component, at said location, being on the other side of said member;

(D) first coupling means, attached to said first ceiling component and extending across a first longitudinal portion of the top of said support member, for supporting said first ceiling component at a distance above the floor of said room; and

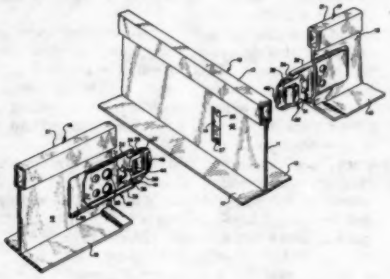
(E) second coupling means, attached to said second ceiling component and extending across a second longitudinal portion of the top of said support member, each of the points of said second portion being located at a longitudinal position different than the points of said first portion, for supporting said second component at a distance above the floor of said room.

4,648,230

LOCKING CONNECTION FOR SUSPENSION CEILING GRID SYSTEMS

David F. Mieyal, Strongsville; Richard Shirey, Avon, and Robert F. Worley, Bay Village, all of Ohio, assignors to Donn Incorporated, Westlake, Ohio

Filed Jul. 24, 1985, Ser. No. 758,410
Int. Cl.[4] E04C 2/42; E04B 5/52
U.S. Cl. 52—667 **9 Claims**



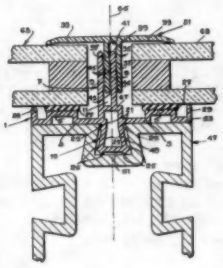
1. A suspension ceiling grid system comprising elongated through-runners and opposed runner ends adapted to be interconnected in a grid, said through runners providing a connector opening having sides, said runner ends providing end connectors proportioned to be positioned within said connector openings from opposite sides thereof by longitudinal movement to provide a grid intersection, said end connectors providing first locking means for locking said end connectors to said through-runner and second locking means for locking two end connectors together within a connector opening, said connector opening and each of said end connectors being structured so that when said connectors are fully installed within said opening each connector is movable in the direction of the length of said through-runner, each locking means being engaged by movement in a first direction aligned with the length of said through-runner and released by movement in a second direction opposite said first direction, and releasable means normally preventing relative movement in said second direction to maintain said locking means locked.

4,648,231

STRUCTURAL JOINT ELEMENT FOR PANELS

Francois X. Laroche, P.O. Box 1024, Waterloo (Quebec), Canada (J0E 2N0)

Filed Aug. 20, 1985, Ser. No. 767,608
Int. Cl.[4] E04C 2/34; A44B 21/00
U.S. Cl. 52—775 **12 Claims**



1. A structural joint including a first and a second joint element,

said first joint element having a generally cross-like, body comprising:

a pair of aligned lateral arms, each arm having opposed faces and an end and being formed with a pedestal projecting from one of said opposed faces, each pedestal having a free end with a roughened anti-slip surface;

a U-shaped first connector member having a pair of straight legs spaced from one another to define therebetween a chamber having a bottom and an open end, said legs projecting perpendicularly from said one face and being integral with said lateral arms at adjoining ends of said lateral arms;

a second connector member integral with said lateral arms and projecting perpendicularly from the other one of said opposed faces of said lateral arms and perpendicularly from said adjoining ends; said second connector member having a narrow neck portion joining said lateral arms and a wide portion extending from said narrow neck portion;

a series of teeth on each of said legs of said first connector member and inwardly of said chamber of said first connector member, said teeth being inclined toward said bottom of said chamber of said first connector member, and a further series of like teeth on one only of said legs outwardly of said chamber;

said second joint element having a generally T-shaped body comprising:

a pair of aligned lateral arms integral with one another and having an inner face;

a U-shaped third connector member having a pair of straight legs spaced from one another to define therebetween a chamber having a bottom and an open end, said legs projecting perpendicularly from said inner face of said lateral arms and being integral with said lateral arms at adjoining ends of said lateral arms;

a series of teeth on each of said legs of said third connector member and inwardly of said chamber of said third connector member, said teeth being inclined toward said bottom of said chamber of said third connector member, and a further series of like teeth on one only of said legs outwardly of said chamber,

wherein said chambers of said first and third connectors are equal in width and the thickness of one of said legs of each of said first and third connector members is essentially equal to said width of said chambers, said legs being slid into respective ones of said chambers for interengagement of said teeth and interlocking of said first and third connector members selectively at one of a plurality of locations within said chambers,

wherein said lateral arms of said second joint element are of equal width and are separated by a center line perpendicular thereto, and said second connector member has a longitudinal axis coaxial with said center line, and

wherein said chambers defined by said pairs of legs of said first and third connector members have center lines parallel with and offset from said longitudinal axis, on either side thereof.

4,648,232

APPARATUS FOR CHECKING THE QUALITY OF ROD-SHAPED, CYLINDRICAL OBJECTS

Alfred Brinker, Gevelsberg; Iain G. Stewart, and Uwe Dreyer, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Fr. Niepmann GmbH & Co., Gevelsberg, Fed. Rep. of Germany

Filed Apr. 11, 1986, Ser. No. 851,123

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1985, 3513302; Mar. 19, 1986, 3609094

Int. Cl.[4] B07C *5/00*; B65B *57/14*

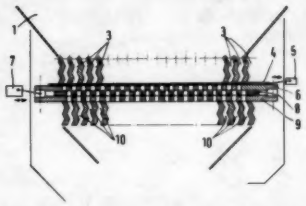
U.S. Cl. 53—54 **12 Claims**

1. An apparatus for checking the quality of rod-shaped, cylindrical objects that are fed from a storage container to a plurality of essentially parallel chutes, each of which has associated therewith at least one checking device and a subsequently disposed ejection mechanism for ejecting defective ones of said rod-shaped objects; said apparatus comprising:

essentially vertically disposed ones of said chutes, each of which has a width that is only slightly greater than the diameter of said rod-shaped objects, with at least that portion of each of said chutes remote from said storage container being provided with a zig-zagged course that has at least one bend;

a first slide mechanism disposed on that side of said chutes remote from said storage container; said first slide mechanism is provided with openings, each designed to receive a respective one of said rod-shaped objects, with the number of said openings corresponding to the number of said chutes;

means for shifting said first slide mechanism, in a controlled manner, transverse to said chutes over a distance that corresponds at least to said width of said chutes;



a fixed carrier disposed on that side of said first slide mechanism remote from said chutes; said carrier is provided with support members that are disposed adjacent to said first slide mechanism, with respective openings, each designed to receive a respective one of said rod-shaped objects, being disposed between said support members; a given one of said ejection mechanisms is associated with each of said openings of said carrier, with each ejection mechanism being actuatable as a function of the result of said at least one checking device of the associated chute, with said checking devices being disposed on that side of said first slide mechanism remote from said carrier; and

a second slide mechanism disposed on that side of said carrier remote from said first slide mechanism, with said second slide mechanism being embodied in conformity with said first slide mechanism, and having a possibility of movement that corresponds to that of said first slide mechanism.

4,648,233

APPARATUS FOR HANDLING LIQUID FILLED FLEXIBLE PLASTIC BAGS

Willard D. Holland, Kenosha, Wis., assignor to B-Bar-B, Inc., New Albany, Ind.

Filed May 29, 1985, Ser. No. 738,801

Int. Cl.[4] B65B *57/00*

U.S. Cl. 53—55 **4 Claims**

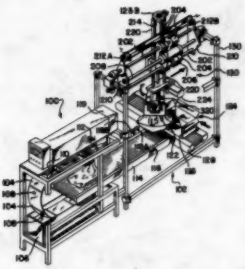
1. Apparatus for handling flexible plastic bags filled with liquid comprising: bag supporting means for supporting said bags in a substantially flat horizontal orientation having a substantially flat upper surface, said supporting means defining a pick-up location for flexible plastic bags filled with liquid;

bag gripper means for gripping said liquid filled flexible plastic bags and comprising a pair of clamping members defining enlarged bag clamping faces, means opening and closing said members to progressively engage a substantial portion of the flat upper surfaces of said bags between the clamping faces, and resilient means secured to said enlarged bag clamping faces to grip said bags without damage thereto;

bag transport means for supporting said bag gripper means

and for vertically and horizontally moving said bag gripper means between said pick-up location and a drop-off location; and

sequencer means for controlling said bag transport means and said gripper means such that flexible plastic bags filled



with liquid are engaged by said bag gripper means at said pick-up location, vertically raised clear of said pick-up location, horizontally carried from said pick-up location to said drop-off location, and vertically lowered to be deposited at said drop-off location.

4,648,234

AUTOMATIC BAG-LOADING ATTACHMENT FOR ROTARY BAG-FILLING MACHINES

Enrica Bellini, Via San Gottardo, Castione CH-6532, Switzerland

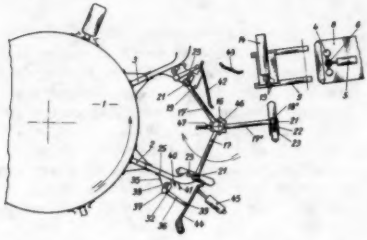
PCT No. PCT/CH80/00046, § 371 Date Jan. 15, 1981, § 102(e) Date Jan. 15, 1981, PCT Pub. No. WO80/02409, PCT Pub. Date Nov. 13, 1980

PCT Filed Apr. 22, 1980, Ser. No. 225,260

Claims priority, application Switzerland, May 8, 1979, 4284/79

Int. Cl.⁴ B65B *43/50*

U.S. Cl. 53—67 **13 Claims**



1. An automatic bag-loading apparatus for placing valve bags onto the spouts of a bag-filling machine comprising

a carousel structure;

means rotatably mounting said carousel structure, said carousel structure including carrier arms equipped at their ends with bag-placing grippers, said grippers having means to grip and hold the bags at their valve ends with open valves;

synchronizing means mounted on the bag-filling machine;

guiding means associated with the carrier arms to guide the bag-placing grippers; and

channel means associated with the synchronizing means to receive and lead the guiding means towards the spouts of the bag-filling machine.

4,648,235

APPARATUS FOR FEEDING CIGARETTES TO A PACKAGING STATION

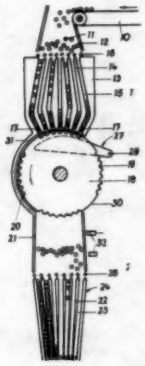
Manfred Oberdorf, Gevelsberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Alfred Schmermund GmbH, Gevelsberg, Fed. Rep. of Germany

Filed Nov. 12, 1985, Ser. No. 796,706

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1984, 3442462

Int. Cl.⁴ B65B *57/06*

U.S. Cl. 53—54 **18 Claims**



1. Apparatus for delivering cigarettes from a source of loose cigarettes to a packaging machine comprising:

at least first means for receiving cigarettes from the cigarette source, said first receiving means including plural guide channels each having entrance and exit ends for stacking cigarettes one above the other and for distributing the received cigarettes in individual rows, said rows being spaced and having a width of one cigarette, said receiving means further including means for sensing the quality of a cigarette at a particular location in each of said channels and generating signals indicative of cigarettes of unacceptable quality;

means for arranging a group of cigarettes consisting of a preselected number of cigarettes with their axes parallel and defining a plane for subsequent feeding as a unit to a packaging machine; and

means for transferring cigarettes from said receiving means to said arranging means, said transferring means including:

at least first rotatable drum means, said drum means having a generally cylindrical shape and being provided with plural spatially displaced groups of grooves on its curved side surface, said grooves each being sized and shaped to receive a single cigarette, said grooves in each group corresponding in number to the rows formed by said receiving means guide channels, said grooves in each group being spaced apart by distances which are commensurate with the distances between corresponding rows in said receiving means at the point of closest approach of said receiving means to said transferring means,

funnel means located below and in communication with said drum means, said funnel means being positioned above and in communication with said arranging means,

means for imparting stepwise rotational motion to said drum means to advance each group of grooves in increments from a top stationary position in alignment with said receiving means guide channel formed rows to a bottom stationary position in communication with said funnel means,

means permitting delivery of the cigarettes from each of said receiving means rows which includes cigarettes

substantially simultaneously into grooves of one of said group of grooves during the time between steps of motion of said drum means,

means for retaining cigarettes in said grooves during rotational movement thereof between the said top position and the said bottom position of said drum means, said cigarettes being released to said funnel means when reaching said bottom position; and

means for ejecting cigarettes of unacceptable quality from said drum means grooves when the drum means is stationary between the stepped motions, such that the ejected cigarettes will not be transferred to said arranging means.

4,648,236

PACKAGING MACHINE INCLUDING A FOLDING, SEALING AND CONVEYING APPARATUS

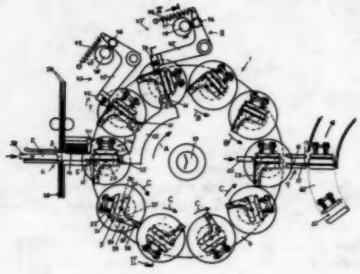
Alfred Knecht, Neuhausen am Rheinfall, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Apr. 29, 1986, Ser. No. 857,111

Claims priority, application Switzerland, Apr. 30, 1985, 1874/85

Int. Cl.[4] B65B *11/23*

U.S. Cl. 53—234 **13 Claims**



1. In a packaging machine including a folding, sealing and conveying apparatus for individually wrapping generally flat, rectangular items in a wrapper sheet; the apparatus including a turntable having a rotary axis; drive means for rotating said turntable in increments; a plurality of pocket assemblies arranged in a circular array on said turntable; each pocket assembly including first and second walls arranged to engage, with respective wall faces, opposite faces of the article for holding the article in the pocket assembly; the apparatus further including a charging station being situated adjacent said turntable and being arranged for introducing, in a direction generally radially inwardly relative to said axis, an article with a wrapper sheet in between said first and second walls of a pocket assembly dwelling in the charging station; a sealing station being situated adjacent said turntable, spaced from said charging station and having a sealing shoe arranged for providing a longitudinal fin seal on superposed flaps of the wrapper sheet; folding means situated between said charging station and said sealing station for superposing said flaps as the respective article, held in the pocket assembly, travels from said charging station into said sealing station; and a discharge station being situated adjacent said turntable, spaced from said charging station and said sealing station and being arranged for ejecting, in a direction generally radially outwardly relative to said axis, an article wrapped in the wrapper sheet, from the pocket assembly dwelling in the discharge station; said wall faces of said first and second walls being oriented radially in said charging station and said discharge station; the improvement comprising

(a) an extension affixed to the first wall of each said pocket assembly and being oriented at an angle to said first wall; said extension having a support face cooperating with said folding means and with said sealing shoe as a countersupport therefor for backing up said flaps of said wrapper sheet; and

(b) turning means for rotating each said pocket assembly approximately 180° relative to said turntable for setting said extension into a radially relatively outward position in said charging station and a radially relatively inward position in said discharge station.

4,648,237

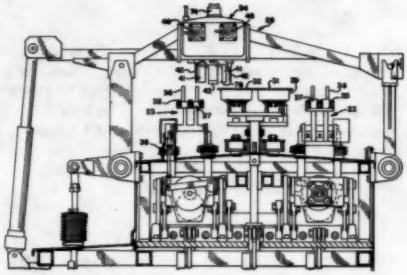
STACK HANDLING METHOD AND APPARATUS

Robert V. Total, Sun Prairie, Wis., assignor to Oscar Mayer Foods Corp., Madison, Wis.

Filed Jan. 13, 1986, Ser. No. 818,309

Int. Cl.[4] B65B *5/06, 39/02, 39/12*

U.S. Cl. 53—473 **21 Claims**



1. An apparatus for transferring a stack of sliced food products from a loading station into a close-fitting cavity of a container, the apparatus comprising:

a stack conveyor assembly for transporting a stack of products;

a stack lifter assembly positioned generally below said stack transporting conveyor assembly, said stack lifter assembly including lifter means for raising said stack of products above said conveyor assembly;

a picker head assembly having picker head means for grasping said stack of products when same is on said lifter means;

a conveyor assembly for transporting a container having a cavity that is close-fitting with respect to said stack of products, said container conveyor assembly being associated with means for positioning the container, and said container conveyor assembly being generally parallel to said stack conveyor assembly; and

said picker head assembly includes transport means for moving said picker head and stack of products grasped thereby from said stack lifter means and into said close-fitting cavity of the container at said container positioning means.

4,648,238

REMOVABLE GRASS CATCHER

C. Austin Greider, Des Moines; David G. Stephenson, Urbandale; Terry R. Lee, Des Moines, and John R. Durfee, Ankeny, all of Iowa, assignors to Western International, Inc., Des Moines, Iowa

Filed Mar. 18, 1985, Ser. No. 712,848

Int. Cl.[4] A01D *35/22*

U.S. Cl. 56—202 **5 Claims**

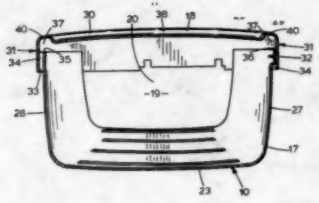
1. A removable grass catcher for a rotary lawn mower comprising:

(a) a relatively rigid housing defining an interior cavity having an inlet opening at one end adapted to be positioned in registry with the discharge opening of said lawn

mower for the accumulation of grass clippings in said cavity;

(b) said housing having a front open end defining said inlet opening, a top wall, bottom wall, rear wall and opposite side walls;

(c) said top wall of said housing is formed of a major portion that substantially defines the ceiling of said cavity, and at least one downwardly extending peripheral flange along at least one of the rear and side edges of said major portion;



(d) at least a part of said major portion of said housing top wall and said flange are spaced apart from the upper edge portions of at least one of said rear and side walls of said housing adjacent to the flange of said top wall, with said flange overlapping said upper edge portions to form a passage that provides air gaps therebetween near the top of the housing above the primary flow of grass clippings to serve as an air vent for said housing during the accumulation of grass clippings therein.

4,648,239

BALING MACHINE

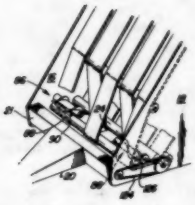
Jens Geiser, Zweibrucken, Fed. Rep. of Germany, and Jean Viaud, Sarreguemines, France, assignors to Deere & Company, Moline, Ill.

Filed May 1, 1986, Ser. No. 858,467

Claims priority, application United Kingdom, May 13, 1985, 8512087

Int. Cl.⁴ A01D *39/00*

U.S. Cl. 56—341 **12 Claims**



1. In a machine for harvesting crops having rotatable rolls located for coming into contact with crop, and having opposite ends supported in bearings, a scraper assembly associated with at least one roll for preventing crop from wrapping about the roll and said scraper assembly including an elongate member rigid with the roll and extending along it and a scraper generally paralleling said roll and having an edge disposed at least very close to said elongate member, the improvement comprising: an auger disposed adjacent the scraper so as to move crop away from the scraper.

4,648,240

CONTINUOUS HIGH SPEED SPIN-DRAW-TEXTURING PROCESS FOR NYLON YARN

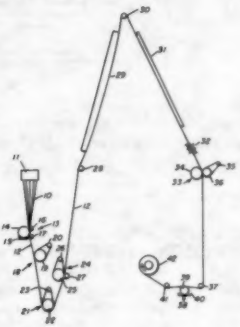
Rodney S. Hallsworth, and Ralph C. Wirsig, both of Kingston, Canada, assignors to Du Pont Canada Inc., Mississauga, Canada

Filed Dec. 24, 1985, Ser. No. 813,203

Claims priority, application United Kingdom, Dec. 28, 1984, 8432736

Int. Cl.⁴ D02G *1/02*; D01D *5/16, 5/22*; D02J *1/22*

U.S. Cl. 57—288 **17 Claims**



1. A continuous spin-draw-false twist texturing process for producing a textured nylon yarn having high yarn uniformity, the process comprising the steps of:

(a) melt spinning a plurality of nylon filaments from nylon polymer;

(b) cooling the filaments and combining them to form a yarn;

(c) controlling the processing conditions of the nylon polymer of step (a) such that the relative viscosity of the yarn formed in step (b) is at least 45;

(d) partially drawing the yarn at a draw ratio of from 2.3 to 3.5 and at a temperature of at least 50° C.;

(e) simultaneously false twist texturing and further drawing the partially drawn yarn in a draw-false twist texturing zone at a draw ratio of from 1.1 to 1.5; and

(f) withdrawing the textured nylon yarn at a speed of at least 1500 meters per minute.

4,648,241

ACTIVE CLEARANCE CONTROL

Robert L. Putman, Bolton, and Merle L. Dinse, S. Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 3, 1983, Ser. No. 548,467

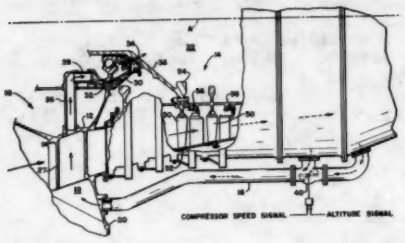
The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.

Int. Cl.⁴ F02C *7/18*

U.S. Cl. 60—39.29 **2 Claims**

1. An active clearance control system for a twin spool gas turbine power plant operating over an engine operating envelope including a cruise mode having a plurality of stages of axial flow compressors defining the high pressure compressor spool and the low pressure compressor spool powering aircraft, each compresor stage having a stator including circumferentially spaced vanes, a disc supporting a plurality of compressor blades and an outer air seal, said compressor stages rotatably supported in an engine case to a shaft supported by bearings, said bearings being in proximity to the entrance of the high pressure spool of said compressor stages, means for selectively bleeding air from separate compressor stages in the high pressure compressor spool, and means including an external conduit and tube means for leading said bled air into the bore of said high pressure spool, through an opening in the engine's

casing, a hollow stator vane in the low pressure compressor spool, through said bearing and said high pressure spool shaft and means responsive to engine operating parameters for controlling said selective bleeding means so as to introduce air into said bore from the hottest stage of said bleeding stages during the cruise mode of said power plant.

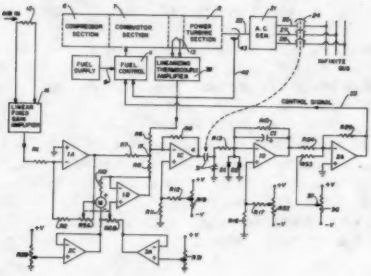


4,648,242

APPARATUS FOR PROVIDING A CONSTANT FUEL CONSUMPTION RATE FOR A FUEL POWERED TURBINE

Robert E. Griesinger, Orinda, Calif., assignor to Williams & Lane Energy Systems Corporation, Benicia, Calif.

Filed Jul. 23, 1985, Ser. No. 758,053
Int. Cl.[4] F02C *9/40*
U.S. Cl. 60—39.03 **10 Claims**



1. Apparatus for providing a constant energy consumption rate for a fuel powered turbine engine having an air compressor section, a combustion section and a power turbine section, a fuel supply line connected to said combustion section and a fuel control mounted in said fuel supply line, comprising:

first means for sensing the compressor section inlet temperature (CIT) and generating a first signal representative thereof;

second means for sensing the power turbine section inlet temperature (TIT) and generating a second signal representative thereof;

third means connected to said first means, said second means and said fuel control and being responsive to said CIT and said TIT for modulating said fuel control to maintain a constant energy consumption rate in accordance with the formula:

$$\Delta TIT/\Delta CIT = C$$

where C is a constant corresponding to a constant fuel consumption rate; and

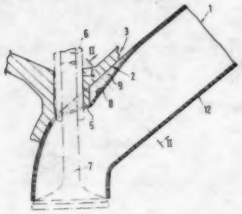
fourth means for controlling the value of C for thereby controlling said energy consumption rate.

4,648,243

HOLLOW CERAMIC BODY

Hans Korkemeier, Weissach, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Dec. 21, 1984, Ser. No. 684,866
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1983, 3346394
Int. Cl.[4] F01N *7/18*
U.S. Cl. 60—272 **12 Claims**



1. A hollow, tubular ceramic gas-conducting channel of a cylinder head in an internal combustion engine including,

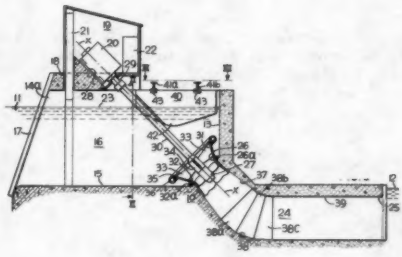
at least one lateral depression, said depression being filled with a pressure-resistent thickening for optimizing the strength of the ceramic channel.

4,648,244

INCLINED REACTION TURBINE WITH VORTEX SUPPRESSION

Howard A. Mayo, Jr., York, and Warren G. Whippen, Dover, both of Pa., assignors to Voith Hydro, Inc., York, Pa.

Filed Nov. 29, 1984, Ser. No. 676,419
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—398 **2 Claims**



1. A low head hydraulic turbine installation comprising:

a foundation structure separating an upper elevation headwater having an upper water surface from a low elevation surface tailwater;

said foundation having a back wall, a pair of laterally spaced vertical side walls projecting upwardly of said headwater upper surface and a generally level floor defining an open flume for containing a level of water in water flow communication with said headwater;

gate means for selectively blocking water flow from said headwater into said flume;

a water passageway formed through said structure connecting said flume in water flow communication with said tailwater;

said passageway having an outlet submerged within said tailwater and an inlet submerged within said flume;

a turbine runner supported within said inlet and rotatable

about an axis of rotation generally coaxial with a cylindrical axis of said inlet; a generator;

a rotary shaft connecting said generator and said runner;

a plurality of plate members;

means mounting said plate members above said level of water contained in said flume adjacent said back wall with said plate members maintained in fixed space relation generally parallel to said cylindrical axis and with a lower portion of each plate projecting downwardly through said headwater upper water surface and into said headwater within said flume.

4,648,245

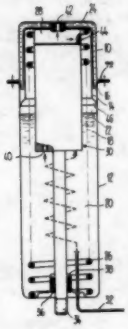
ELECTRO-HYDRAULIC ACTUATOR OR POSITIONING DRIVE FOR CONTINUOUS CONTROL OR REGULATION OPERATIONS

Hans-Michael Mayer, Jona, Switzerland, assignor to Elektrowatt AG, Zurich, Switzerland

Filed Apr. 30, 1985, Ser. No. 729,061

Int. Cl.⁴ F16D *31/02*

U.S. Cl. 60—477 **10 Claims**



1. An electro-hydraulic actuator for performing continuous control or regulation operations, comprising:

a vibrating armature pump for delivering a hydraulic fluid;

a pressure-operated return valve cooperating with said vibrating armature pump;

an actuation member cooperating with said vibrating armature pump;

a return spring acting upon said actuation member;

said actuation member being displaceable by the hydraulic fluid acting in a pressure chamber against the force of said return spring in dependence of an externally supplied adjustment signal;

means for delivering said externally supplied adjustment signal;

said externally supplied adjustment signal comprising an alternating-current signal of variable potential;

said vibrating armature pump being powered directly by the externally supplied adjustment signal;

said vibrating armature pump being capable of generating a variable pressure in the hydraulic fluid in direct dependence of said variable potential of the externally supplied adjustment signal;

said vibrating armature pump being capable of generating a pressure differential between said vibrating armature pump and said pressure chamber of said actuation member; and

said pressure-operated return valve comprising as a control element only a membrane valve for controlling a return flow of said hydraulic fluid in dependence of said pressure differential.

4,648,246

ARRANGEMENT FOR DETERMINING THE DIFFERENCE BETWEEN DIFFERING AND CHANGING TEMPERATURES FOR ACTIVATING A CONTROL, REGULATING, MEASURING OR RECORDING PROCESS AND THE APPLICATION OF THE ARRANGEMENT IN A HEAT COUNTER

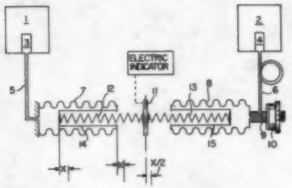
Jakob Huber, Les Aveneyres 8, 1806 St.-Legier, Switzerland

Filed Jan. 7, 1985, Ser. No. 689,327

Claims priority, application Switzerland, Jan. 13, 1984, 397/84

Int. Cl.⁴ F03D *5/00*

U.S. Cl. 60—530 **6 Claims**



1. An apparatus for producing an electric signal as a function of the difference between two variable temperatures by means of a temperature sensor with expansion fluid in two locations separated and thermally insulated from each other in order to activate a control, regulating, measuring or recording process dependent upon a determinable temperature difference between said locations, whereby the determined temperature difference is independent of the absolute magnitude of the ambient temperatures, said apparatus including two expansion systems each with a metallic bellows the interiors of which are in fluid connection through capillary tubes with a temperature sensor so that each of the metallic bellows is functionally connected directly or indirectly to one of the ends of a spring so that the other ends of these springs are supported on opposite sides of a reference element, said springs operating in opposition on said reference element, said reference element producing said electric signal in response to differential spring pressures, thereby to supply said electric signal for the control, regulating, measuring or recording process.

4,648,247

LOW-TEMPERATURE SHOWCASE

Takashi Takizawa, and Tsutomu Tanaka, both of Gunma, Japan, assignors to Sanyo Electric Co, Japan and Tokyo Sanyo Electric, both of, Japan

Filed Oct. 22, 1985, Ser. No. 790,268

Claims priority, application Japan, Oct. 24, 1984, 59-223737; May 9, 1985, 60-98242; May 21, 1985, 60-75407

Int. Cl.⁴ A47F *3/04*

U.S. Cl. 62—256 **22 Claims**

1. A low-temperature showcase comprising:

a case main body having at one side thereof an inlet-outlet opening for commodities and including an inner wall, an outer wall and a partition wall defining between the inner and outer walls an inner passage and an outer passage for passing air therethrough,

two heat exchangers disposed in the inner passage and the outer passage respectively for providing refrigeration cycles along with a compressor, a condenser and reducing valves,

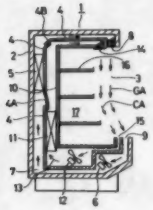
blowers disposed in the inner and outer passages respectively for passing air through the two passages in the same direction and adapted to form at least a double air curtain at the inlet-outlet opening with the air circulated through the inner and outer passages,

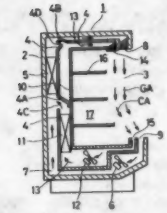
the heat exchanger in the inner passage being positioned upstream of and at a predetermined distance from the other heat exchanger with respect to the same direction of

air flows, the partition wall having a first window at a portion thereof between the two heat exchangers,

first passage change-over means for opening or closing the first window to close or open the inner passage downstream of the first window, and

first control means for giving instructions to the first passage change-over means for its operation, the first control means being operative to instruct the first passage change-





over means to open the first window and close the inner passage downstream of the first window when the heat exchanger in the inner passage is operated for defrosting with the heat exchanger in the outer passage operated for refrigeration, whereby the air flow through the heat exchanger in the inner passage is guided into the outer passage through the opened first window and cooled by being passed through the heat exchanger in the outer passage.

4,648,248

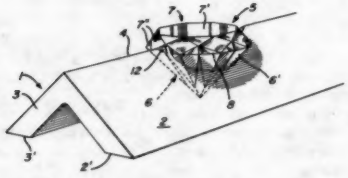
PRECIOUS STONE SETTING

Yves Raymond, 8755 Albanel Street, Saint-Léonard, Canada (H1P 2X9)

Filed Jul. 19, 1985, Ser. No. 756,683

Int. Cl.[4] A44C *17/02*

U.S. Cl. 63—28 **3 Claims**



1. A precious cut stone in combination with a setting therefor, said cut stone having a shape of the type defining a contour edge, a crown upwardly projecting from said contour edge and defining upwardly converging first facets and a lower portion downwardly projecting from said contour edge and defining downwardly converging second facets, said setting comprising an angle member made of rigid but deformable material, said angle member consisting of two cross-sectionally straight flanges meeting at an uppermost lengthwise ridge and diverging from said ridge at a generally 90° angle, said angle member being formed with a cavity to support said precious stone, said cavity extending through said ridge and downwardly equally through said flanges on each side of said ridge, the edge of said cavity forming a seat for said lower portion of said stone, said seat having opposite portions extending across said ridge which are downwardly countersunk a distance sufficient for said ridge to be at a higher level than said contour edge when said stone is supported on said seat and a tab integral with said ridge at both said opposite seat portions of said cavity and overlying an adjacent said first facet, thereby securely retaining said stone in said cavity with portions of said second facets exposed at the outer faces of said flanges.

4,648,249

NEEDLE SELECTING ARRANGEMENT FOR KNITTING MACHINES

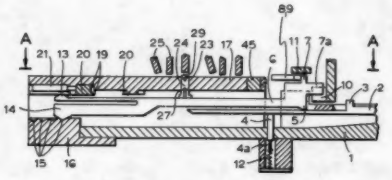
Andreas Neuer; Eberhard Grimmer, and Hartwig Müller, all of Karl Marx Stadt, German Democratic Rep., assignors to VEB Kombinat Textima, Karl Marx Stadt, German Democratic Rep.

Filed Nov. 1, 1985, Ser. No. 794,240

Claims priority, application German Democratic Rep., Nov. 1, 1984, 268991

Int. Cl.[4] D04B *7/00*

U.S. Cl. 66—75.2 **21 Claims**

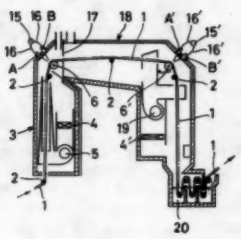


1. A needle selecting arrangement for a knitting machine with a knitting and stitching transmitting cam and a plurality of electromagnetic selecting elements, the arrangement comprising a plurality of spring biased needles each having a needle shaft; at least one switchable displacement cam part arranged to move in front of the knitting and stitching transferring cam; a plate cover having a lower edge and a plurality of openings which are arranged in a stepped manner in association with the selecting elements and normal to a needle bed plane; an arresting rail provided with a plurality of grooves; a plurality of plates having a first side which faces toward the needles and provided at said first side with a substantially spherical end arranged to abut against the needle shaft and with a plate foot cooperating with said displacement cam part, each of said plates having an opposite second side which is fork-shaped and is provided with cam projections for tensioning against said lower edge of said plate cover and engageable into said grooves of said arresting rail in a position-changeable pivotable manner; means forming a plurality of plate tracks in operating region of said displacement cam part; and a plurality of selecting pins arranged to abut loosely against a respective one of said plates and extending in correspondence with a selection through a respective one of said openings of said plate cover; and a plurality of pressure cam parts turnable by the electromagnetic selecting elements and arranged so that said selecting pins cooperate with said pressure cam parts.

4,648,250
APPARATUS FOR DYEING A WEB OF FABRIC CONTINUOUSLY

Tomoyoshi Yabe, Kawachinagano, Japan, assignor to Suminoe Textile Co., Ltd., Osaka, Japan

Filed Jun. 3, 1985, Ser. No. 740,774
Claims priority, application Japan, Jun. 15, 1984, 59-123957; Jun. 15, 1984, 59-123958
Int. Cl.[4] D06B 1/02
U.S. Cl. 68—5 D 2 Claims

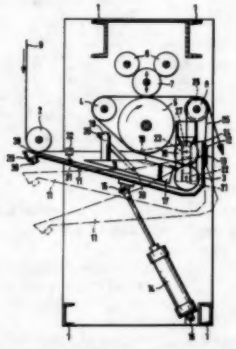


1. Apparatus for continuously dyeing a web of fabric, particularly pile fabric, comprising:
- a dry heating unit for heating the fabric to a dye-reactive temperature while transferring it;
- a wet heating unit connected to said dry heating unit to form a complete unit for fixing a dyeing reaction;
- a pile separating roller provided in said dry heating unit and said wet heating unit so as to extend crosswise with respect to the fabric for bending the fabric and thus separating the piles on the fabric; and
- a plurality of spray means provided in said dry heating unit and said wet heating unit so as to be opposed to said pile separating roller for spraying a dye and/or chemical in a fan-shaped film into space between the piles separated by said pile separating roller.

4,648,251
MACHINE FOR DYEING, FINISHING AND IMPREGNATING A SPREAD OF FABRIC WEB

Günther Kehlenbach, Würselen, Fed. Rep. of Germany, assignor to H. Krantz, GmbH & Co., Aachen, Fed. Rep. of Germany

Filed Jan. 9, 1985, Ser. No. 690,109
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1984, 3403784
Int. Cl.[4] D06B 3/12
U.S. Cl. 68—15 3 Claims

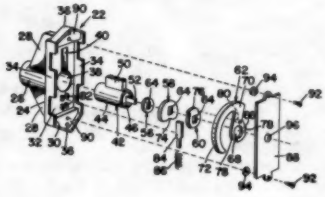


1. In a dyeing, finishing and impregnating apparatus for the processing of a spread fabric web of the type comprising a frame, a trough for a bath through which a section of fabric may be continuously advanced, said device including a pressure roll and a counter roll mounted on said frame above said trough, the improvement which comprises said trough having generally triangular sidewalls, variable mounting means interposed between said frame and trough and supporting said trough, said mounting means including a slide member vertically movably mounted on said frame, a support axis on said trough in the region of a corner portion of said sidewall, said axis being secured to said slide member, and means for shifting said slide member in a vertical direction between operative and inoperative positions, a displacement body including a heat exchanger mounted to said frame, said displacement body being completely immersed in said trough in the operative position thereof and being at least partially clear of said trough in said inoperative position, the lower inner surfaces of said trough and the lower outer surfaces of said body together defining a guideway for a length of fabric traversing said trough, a trough roll mounted in said trough, a support roll disposed above said trough, said rolls having their axes in parallel alignment with said support roll being supported by said trough roll in said operative position, vertical guide means fixed to said frame, said trough and support rolls including bearings mounted in said vertical guide means, a guide roll mounted on said frame above said support roll, and a traction element having a first end connected to said support axis of said trough and a second end connected to said support roll, said traction member being passed over said guide roll, whereby downward movement of said trough effects upward movement of said support roll.

4,648,252
SLIDING DOOR LOCK

Thomas J. Dugan, 226 Paseo de Cristobal, San Clemente, Calif. 92672

Filed May 3, 1985, Ser. No. 730,191
Int. Cl.[4] E05B 65/08
U.S. Cl. 70—100 4 Claims



1. A lock for securing a door in closed position relative to a door jamb, comprising:
- a lock housing having front and rear sides, a cavity entering the rear side of the housing and bounded about its perimeter by an edge wall of said housing having a rear edge disposed in a rear plane of the housing, an opening extending through said housing from said front side into said cavity on an axis substantially normal to said plane, and means for securing said housing to the door with the rear housing side toward the door,
- a readily replaceable key lock unit contained within said housing opening for removal from and insertion into the opening only through said cavity and the rear end of said opening,
- said lock unit including an outer barrel fixed against rotation relative to said housing, and an inner cylinder having front and rear ends and rotatable in said barrel about said axis by a key inserted into a key slot in the front end of the cylinder accessible through the front end of said opening,
- a lock member within and removable through the open rear side of said cavity and projecting from said cavity laterally of said axis through an opening in said housing edge wall,

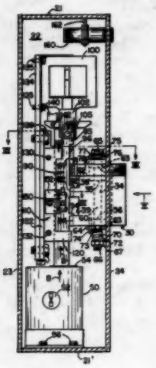
and means releasibly coupling said lock member to the rear end of said lock cylinder for movement of said lock member through said edge wall opening between locking and unlocking positions by rotation of said cylinder with a key inserted into said key slot, and wherein said lock may be re-keyed by removal of said lock unit and lock member from said housing through the rear open side of said cavity, replacement of the lock unit by a different lock unit requiring a different key for operation, and re-assembly of the lock member and new lock unit in the lock housing through the rear side of the housing.

4,648,253

CELL LOCK

Lee A. Imhoff, Lakeview, Mich., assignor to American Institutional Maintenance Corporation, Lakeview, Mich.

Filed May 13, 1985, Ser. No. 733,105
Int. Cl.[4] E05B *65/06, 15/02*
U.S. Cl. 70—135 **12 Claims**



11. A cell lock for a cell having a vertically pivoted door comprising:

a generally cylindrical locking barrel including a longitudinally extending door receiving slot, said barrel further including surface means for engaging a locking bar for preventing rotation of said barrel;

means for rotatably mounting said barrel in a door jamb associated with a door frame such that said slot can selectively engage an edge of a swinging door mounted within the door frame to hold the door in a closed and locked position;

first bias means coupled between said barrel and said mounting means for urging said barrel into a first door receiving unlocked position and allowing said barrel to rotate to a second locked position;

a locking bar mounted within said mounting means and movable between a first position allowing rotation of said barrel to said first position and a second position engaging said surface of said barrel to prevent its rotating from said second position; and

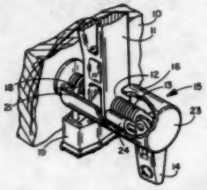
means for moving said locking bar between said second and first positions wherein said moving means includes cam means rotatably mounted coaxially with and independently of said barrel, second bias means for urging said cam means toward a predetermined position, said cam means including an element engaging the door for preventing movement of said cam means when the door is closed, and wherein said locking bar includes a cam follower engaging said cam means such that said locking bar is moved to said first position by said cam means when said door is opened and said cam means rotates to said predetermined position.

4,648,254

OUTBOARD MOTOR LOCK

James L. Bloemers, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 20, 1985, Ser. No. 811,801
Int. Cl.[4] F16B *41/00*
U.S. Cl. 70—232 **4 Claims**



1. A locking device for outboard motors having a clamp bracket, a clamp screw threadedly engaging one end of the clamp bracket, and a clamp handle pivotally attached to one end of the clamp screw, said locking device comprising:

(A) a tubular member, said tubular member adapted to fit coaxially over the clamp screw, said tubular member including a hole through its wall near one end to allow the clamp handle to pass through, a slot through its wall and open at the other end to allow the end of the clamp bracket to fit in said slot, and a locking hole through a wall opposite said slot to engage a portion of said locking means; and

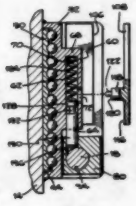
(B) a locking means at the slotted end of said tubular member to lock the slotted end of said tubular member to the clamp screw, said locking means engaging the clamp screw on the side of the clamp bracket opposite the clamp handle, said locking means including a padlock, said padlock having a U-shaped shackle extending through said locking hole to engage said clamping screw and a padlock body engaging the two ends of said U-shaped shackle.

4,648,255

LOCK PROTECTING DEVICE FOR HIGH SECURITY SAFES

Klaus W. Gartner, 2632 Via Anacapa, Palos Verdes Estates, Calif. 90274

Filed Sep. 12, 1984, Ser. No. 649,666
Int. Cl.[4] E05B *15/16, 63/00*
U.S. Cl. 70—417 **5 Claims**



5. An improved multi-function universal plate for protecting a safe locking mechanism having a locking bolt from unauthorized forced access comprising:

a bolt journal supporting means for supporting movement of said locking bolt comprising a guiding aperture for the slidingly movement of said locking bolt in one direction through said aperture causing the bolt to engage a door jamb on an associated safe and the slidingly movement in said opposite direction causing disengagement with said door jamb;

a relocking means for relocking said safe when a first locking

mechanism is defeated from unauthorized forced access to the first locking mechanism;

means for affixing said plate to a safe door; and

a locking bar affixed to said locking bolt having a recess for the insertion of a locking latch when activated by said safe first locking mechanism, and a plunger hole for the insertion of a plunger associated with said relocking means.

4,648,256

SHAPE CONTROL APPARATUS FOR FLAT MATERIAL

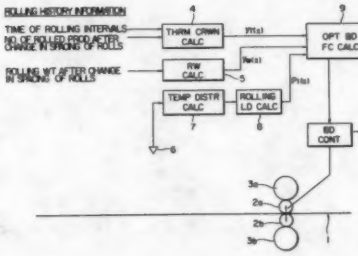
Yoshinori Wakamiya, Mishinomiya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 25, 1985, Ser. No. 727,143

Claims priority, application Japan, May 9, 1984, 59-94907

Int. Cl.[4] B21B *37/10*

U.S. Cl. 72—8 **1 Claim**



1. A shape control apparatus for producing rolled products from flat material and having rolls for shaping said material, said shape control apparatus comprising:

a thermal crown calculating means having an input receiving product number signals representing count of rolled products from flat material rolled in said rolls and time interval signals representing rolling time intervals following rolling of a number of products and operable for determining from said product number and interval-representing signals an output representing thermal crown magnitude in a widthwise direction of said rolls after a change in a space between the rolls following rolling of a number of rolled products,

a roll wear calculating means having an input receiving rolling weight signals representing rolling weight of said rolls and operable for determining from said rolling weight-representing signals an output representing roll wear magnitude in a widthwise direction of said rolls,

means for measuring temperatures of said material at a plurality of points in a widthwise direction at a leading portion of flat material entering said rolls and producing temperature-representing signals,

means for calculating widthwise rolling load distribution on said rollers including:

a temperature distribution calculating means having an input receiving said temperature-representing signals and operable for determining from said temperature-representing signals an output representing a temperature distribution of the material in a widthwise direction of said rolls at the leading portion of the material entering said rolls, said points including a widthwise center of said material,

a rolling load distribution calculating means having an input receiving said output representing widthwise temperature distribution from said last named means and operable for determining therefrom an output representing a widthwise rolling load distribution on said rolls,

an optimum bending force calculating means having an input receiving said outputs representing thermal crown magnitude, roll wear magnitude, and widthwise rolling load distribution and operable for determining therefrom an output representing an optimum bending force to be applied to said rolls, and

means for controlling bending of said rolls receiving said optimum bending force output from said optimum bending force calculating means to control bending of said rolls as the flat material enters the rolls.

4,648,257

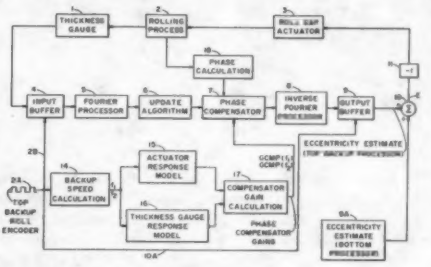
ROLLING MILL ECCENTRICITY COMPENSATION USING ACTUAL MEASUREMENT OF EXIT SHEET THICKNESS

Dickon T. Oliver, Pittsburgh, and D. Fred Stewart, Export, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 30, 1985, Ser. No. 771,505

Int. Cl.[4] B21B *37/02*

U.S. Cl. 72—16 **2 Claims**



1. A method of controlling a rolling mill in which eccentricity of one or more of the rolls in a stand of the mill ordinarily cause cyclic change in the thickness of material exiting the mill, the method comprising the steps of:

directing material through the mill,

locating a device for measuring the thickness of the material exiting the mill downstream from the mill stand,

using said device to measure directly cyclic change in the thickness of the material resulting from roll eccentricity,

providing samples of said cyclic change in thickness during a time period defined by a revolution of at least one of the rolls,

processing the samples of said change by characterizing them as frequency, magnitude and phase angle components of the change using a Fourier transform function,

using said components in an update algorithm to provide a current estimate of the change in thickness,

calculating the delay between the occurrence of the change in thickness in the mill and the occurrence of the measurement of the change, the delay being caused by the distance existing between the mill stand and the location of measurement;

translating the delay into a phase angle component;

modifying the current estimate of the eccentricity phase angle by the angle due to the delay such that the results of the thickness measuring step are made to coincide with the occurrence of the thickness change in the mill,

processing the current estimate of thickness change in a manner that returns the estimate to time based values using an inverse Fourier transform function, and

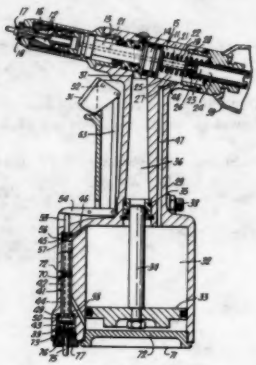
using said time base values to correct for roll eccentricity by controlling the working gap of the mill in a manner that offsets the effects of roll eccentricity in synchronism with the occurrence of eccentricity.

4,648,258

BREAKSTEM FASTENER INSTALLATION TOOL

William H. Frearson, Letchworth, England, assignor to Avdel Limited, Welwyn Garden City, England

Filed May 7, 1986, Ser. No. 860,544
Claims priority, application United Kingdom, May 10, 1985, 8511945; Nov. 4, 1985, 8527118
Int. Cl.[4] B21D 9/05
U.S. Cl. 72—391 6 Claims



1. A hand held fastener installation tool including an airflow ejector, which tool is arranged to stand, when not being held by the operator, in a stable position on a supporting surface,

the tool including automatic shut-off means, responsive to the proximity of the tool to the supporting surface, for automatically shutting off the supply of air to the ejector when the hand-held tool is standing on the supporting surface.

4,648,259

ADJUSTABLE NOSE PIECE

Richard A. Pendleton, Brockton, Mass., assignor to USM Corporation, Farmington, Conn.

Filed Aug. 22, 1985, Ser. No. 768,369
Int. Cl.[4] B21J 15/00, 15/32
U.S. Cl. 72—391 6 Claims

1. A nose piece adapted to be received against the end of a housing of a tool for properly aligning and positioning a fastener with respect to a tool so that the tool can properly perform a desired function with respect to the fastener, comprising:

(a) a pair of substantially symmetrical members each having a main body portion and a tapered outer extension;

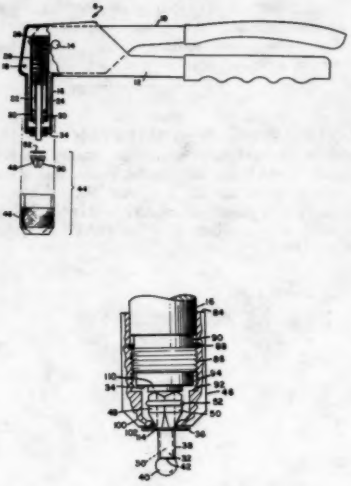
(b) said main body portions of each of said members having opposed ends, one of which is provided with a shoulder contacting the end of the tool housing;

(c) said body portions of each of said members having angularly disposed inner faces merging into a camming surface;

(d) said members each having grooves throughout their longitudinal extent presenting an opening for receipt of the fastener upon which the tool will perform a function;

(e) means surrounding said members biasing said members toward one another; and

(f) means comprising a collar having an opening with a surface for contacting said tapered outer extensions causing said members to pivot about said camming surface against the action of said biasing means to open and close said opening; said biasing means being located on the side of said camming means opposite said tapered outer extension to retain the opening size in a fixed adjusted dimension.

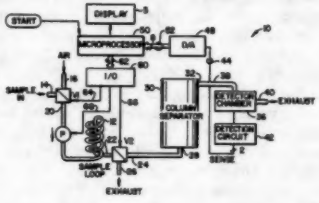


4,648,260

HELIUM DETECTOR

Matthew M. Zuckerman, Sunnyvale, Calif., assignor to Mark Telephone Products, Inc., Santa Clara, Calif.

Filed May 20, 1985, Ser. No. 736,482
Int. Cl.[4] G01N 30/02
U.S. Cl. 73—23.1 5 Claims



1. A method for detecting a suspect component of gas in a gas mixture containing a plurality of component gases mixed with ambient atmosphere, comprising the steps of:

providing a fixed phase separator configured to produce an effluent in which the first component of gas is positionally consigned to a leading and first portion of the effluent relative to the remaining component gases of the mixture;

passing atmosphere through a fixed-phase separator;

commencing the passing of the gas mixture through said fixed-phase separator whereby an effluent in which the first component gas is positionally consigned to a predetermined portion of the effluent relative to the remaining component gases of the gas mixture;

monitoring the rate of change of the thermal conductivity of the effluent at a point after said fixed phase separator during a specific time interval from said commencing step to enable the portion of the effluent to which the first component gas is positionally consigned to pass the monitoring point within said time interval;

monitoring the rate of change of the thermal conductivity of the ambient atmosphere simultaneously with the monitoring of the rate of change of the thermal conductivity of the effluent;

comparing the rate of change of the thermal conductivity of the effluent with the rate of change of the thermal conductivity of the ambient atmosphere to obtain a thermal conductivity comparison;

measuring the thermal conductivity comparison from a time within said time interval wherein said thermal conductivity comparison exceeds a predetermined rate of charge until the rate of change of the thermal conductivity comparison becomes approximately zero; and,

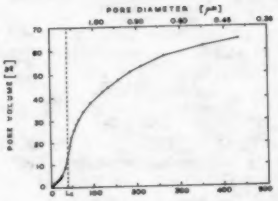
integrating said rate of change of said thermal conductivity comparison from said predetermined rate of change until said rate of change becomes zero to produce therefrom a measure of the quantity of the first component gas in the gas mixture.

4,648,261

METHOD FOR DETERMINING PHYSICAL PROPERTIES OF A POROUS SAMPLE USING CAPILLARY PRESSURE MEASUREMENT

Arthur H. Thompson, Spring, and Alan J. Katz, Houston, both of Tex., assignors to Exxon Production Research Co., Houston, Tex.

Filed Nov. 12, 1985, Ser. No. 797,107
Int. Cl.[4] G01N *15/08*
U.S. Cl. 73—38 **17 Claims**



1. A method for determining pore-dependent properties of a porous sample, including the steps of:

(a) performing nonwetting fluid intrusion measurements on the sample to generate capillary pressure data indicative of the volume of intruded fluid versus applied pressure; and

(b) determining from the capillary pressure data the threshold capillary pressure, p_c, by organizing the data as a graph of intruded fluid volume versus pore diameter and identifying p_c as the inflection point of the rapidly rising portion of the graph, from which the associated characteristic length, l_c, may be determined to be $l_c=(-4)\gamma(\cos\theta)/(p_c)$, where γ is the surface tension of the nonwetting fluid and θ is the contact angle.

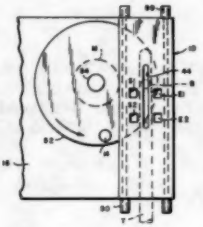
4,648,262

MICROVISCOSIMETER

August K. Reis, Falstenberger Strasse 1, 8000 Muenchen 90; Michael Fiala, Uferweg 15, 8031 Wessling, and Jochen R. Heimann, Diplomingenieur, Roentgenstrasse 30, 8012 Ottobrunn, all of Fed. Rep. of Germany

Continuation of Ser. No. 709,907, Mar. 7, 1985, abandoned. This application Jul. 1, 1986, Ser. No. 881,474
Int. Cl.[4] G01N *11/12*
U.S. Cl. 73—57 **7 Claims**

1. Apparatus for automatically measuring the viscosity of liquids comprising a holder, a support for the holder, means pivotally mounting the holder on the support for angular movement about a horizontal axis, said means including a knob for effecting angular adjustment of the holder to dispose the holder at a selected angle of inclination and means movable by such angular movement to indicate the angle of inclination, said holder containing a bore of predetermined longitudinal and diametrical dimensions, said bore being open at the lower end and closed at the upper end, a capillary tube disposed in said opening containing the liquid, the viscosity of which is to be measured, said capillary tube containing a steel ball, said holder containing at diametrically-opposite sides of said bore between the upper and lower ends of the bore at diametrically-opposite sides of the bore, longitudinally-spaced first openings in communication with the bore, sensing means positioned in said first openings, said holder containing at diametrically-opposite sides of said bore at right angles to said longitudinally-spaced first openings, opposed second openings, one of which is of a length extending along the axis of the bore at least the distance between said first spaced openings, a source of light mounted to the holder adjacent the other of said second openings such as to illuminate the capillary tube to enable observation of the tube through said elongate opening in the one side, a disk mounted to the support for rotation about a horizontal axis at right angles to the axis of rotation of the holder, a permanent magnet mounted to the periphery of the disk, movable by rotation of the disk in a circular path in a plane parallel to the holder such as to alternatively lift the ball from the lower end of the capillary tube to the upper end thereof to release the same so that it gravitates to the lower end, sensing means operable to determine the internal of time that the ball takes to gravitate from the upper to the lower one of said openings according to the selected angle of inclination and said holder containing at diametrically-opposite sides of the bore, parallel bores by means of which the holder can be heated to a predetermined temperature and maintained at said temperature throughout the measuring of the viscosity.

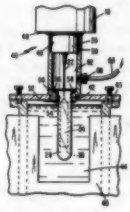


4,648,263

SUPPORT AND CENTERING ATTACHMENTS FOR SENSITIVE VISCOMETERS

Asoke K. Deysarkar, Burwell, and James D. Allen, Woodlands, both of Tex., assignors to Penzoil Company, Houston, Tex.

Filed Dec. 9, 1985, Ser. No. 806,774
Int. Cl.[4] G01N *11/14*
U.S. Cl. 73—59 **16 Claims**



1. A device for supporting a sensitive viscometer above a cylindrical stator containing a predetermined quantity of fluid, the viscosity of said fluid being measured by a cylindrical rotor

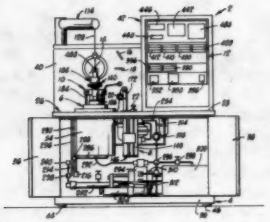
suspended from a pivot housing fixed to the lower end of the viscometer and centered within the fluid by said device, said rotor being rotatable about its longitudinal axis by the viscometer and cooperating with said stator and fluid to create drag related to said vicosity, said device comprising a hollow support member havingan open upper end and upper interior surface shaped to correspond and snugly engage the exterior surface of said pivot housing; said viscometer projecting upwardly from substantially the upper end of said support member, first means for retaining said pivot housing in stationary position and snug contact with said upper interior surface; said support member further including a lower interior cylindrical surface in snug contact with the exterior cylindrical surface of said stator, and second means for retaining said stator in stationary position and snug contact with said lower cylindrical surface, said upper and lower surfaces being coaxial with each other to substantially precisely center the rotor within the stator.

4,648,264

MULTI-FUNCTION APPARATUS FOR TESTING A SAMPLE OF MATERIAL

Dwight L. Freese; Emory L. Frey, and Randall B. Cogbill, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jul. 19, 1985, Ser. No. 757,094
Int. Cl.[4] G01N *11/14*
U.S. Cl. 73—64.1 **20 Claims**



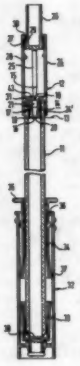
1. An apparatus for testing a sample of material, comprising:
a cabinet;
container means, having a chamber defined therein, for receiving the sample of material in said chamber, said container means connected to said cabinet;
a paddle rotatably disposed within said chamber;
first paddle drive means, connected to said cabinet, for rotating said paddle at a first speed so that the sample is maintained relatively static within said chamber despite said paddle rotating at said first speed;
second paddle drive means, connected to said cabinet, for rotating said paddle at a second speed so that the sample is agitated within said chamber by said paddle rotating at said second speed;
heater means, connected to said container means, for heating the sample within said chamber;
pressurizing means, mounted on said cabinet, for applying a pressure to the sample within said chamber, said pressurizing means including pump means for extracting a measurable quantity of the sample from said chamber, said pump means having a plunger movably disposed therein;
static gel strength test control means, mounted on said cabinet, for controlling said first paddle drive means, including:
first speed control means for setting an angular speed at which said first paddle drive means rotates said paddle;
first set point means for selecting a set point representative of a predetermined static gel strength;
first sensor means for sensing an input force applied by said first paddle drive means to rotate said paddle in response to said first speed control means; and
means, responsive to said first set point means and said first sensor means, for indicating when the sensed input force equals the set point representative of the predetermined static gel strength;
thickening time test control means, mounted on said cabinet, for controlling said second paddle drive means, including:
second speed control means for setting a rotational speed at which said second paddle drive means rotates said paddle;
second set point means for selecting a set point representative of a predetermined consistency;
second sensor means for sensing a parameter proportional to the torque applied by said second paddle drive means in response to said second speed control means; and
means, responsive to said second set point means and said second sensor means, for indicating when the sensed parameter equals the set point representative of the predetermined consistency;
compressibility test control means, mounted on said cabinet, for controlling said pump means, including:
third speed control means for setting a speed at which said plunger of said pump means moves;
directional control means for controlling the direction said plunger of said pump means moves;
third sensor means for sensing a pressure of the measurable quantity of fluid extracted by said pump means;
fourth sensor meas for sensing a volume of the measurable quantity of fluid extracted by said pump means; and
display means, responsive to said third and fourth sensor means, for displaying the sensed pressure and volume; and
temperature control means, mounted on said cabinet, for controlling said heater means to heat said sample to a selectable temperature.

4,648,265

BLOOD SEDIMENTATION APPARATUS

Walter Sarstedt, Nümbrecht-Rommelsdorf, Fed. Rep. of Germany, assignor to Walter Sarstedt Kunststoff-Spritzgusswerk, Rommelsdorf, Fed. Rep. of Germany

Filed Jun. 11, 1985, Ser. No. 743,541
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1984, 3421955
Int. Cl.[4] G01N *33/48*
U.S. Cl. 73—61.4 **19 Claims**



1. Blood sedimentation apparatus for use with a sample container for containing blood, comprising:
an upright transparent sedimentation tube having an upper region and being open at the top and at the bottom and positioned in the sample container containing blood and which can be filled with blood up to a zero mark in the

upper region of the sedimentation tube by displacement of the blood contained in the sample container;

a closure placed on the upper end of the sedimentation tube and sealingly closing said sedimentation tube at said upper end, the closure including:

an overflow vessel;

a hollow spigot communicating with the overflow vessel, extending into the sedimentation tube up to the zero mark, and having a lower opening which lies in the sedimentation tube at the level of the zero mark; and

closure member which can be axially inserted into the hollow spigot to such an extent that its lower end is flush with the lower opening in order to close the lower opening of the hollow spigot when the closure member is inserted and to provide a blood column in said sedimentation tube extending exactly up to said zero mark.

4,648,266

IGNITION TIMING SENSOR SYSTEM FOR A SWIRL CHAMBER TYPE DIESEL ENGINE

Shinji Ikeda, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

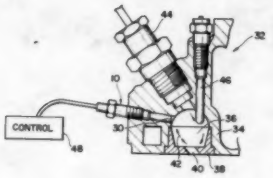
Filed Apr. 30, 1984, Ser. No. 605,189

Claims priority, application Japan, Feb. 10, 1984, 59-16793[U]

The portion of the term of this patent subsequent to Feb. 25, 2003, has been disclaimed.

Int. Cl.⁴ G01M *15/00*

U.S. Cl. 73—117.3 **3 Claims**



1. An ignition timing sensor system for use in a Diesel engine having a swirl chamber that connects with a main combustion chamber via a communicating port that directs air from the main combustion chamber into the swirl chamber substantially tangentially to the wall surface of the swirl chamber to swirl the air in a given direction within the swirl chamber, the system comprising:

a fuel injection nozzle opening into said swirl chamber and injecting fuel into said swirl chamber along said given swirl direction;

a glow plug mounted in said swirl chamber and including a glow portion extending into said swirl chamber and contacting said fuel injected into said swirl chamber by said fuel injection nozzle; and

an ignition timing sensor mounted in the wall of said swirl chamber and positioned opposite said glow portion of said glow plug with respect to said fuel injection nozzle, said ignition timing sensor including an input end that receives combustion light for sensing ignition timing, and said ignition timing sensor being retracted into said wall of said swirl chamber to prevent said ignition timing sensor from protruding into said swirl chamber.

4,648,267

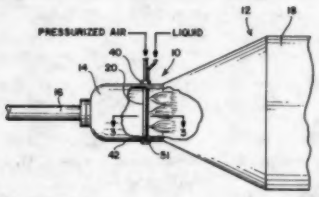
LIQUID SEEDING ATOMIZER

Henry L. B. Seegmiller, Los Gatos, Calif., assignor to The United States Government as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 31, 1986, Ser. No. 846,428

Int. Cl.⁴ B05B *7/04*; G01M *9/00*

U.S. Cl. 73—147 **14 Claims**



8. An atomizer for dispensing small uniform liquid droplets comprising an air supply tube having a plurality of air emitting orifices spaced longitudinally, first and second liquid supply tubes extending longitudinally along said air supply tubes, each liquid supply tube having liquid emitting orifices corresponding in number and longitudinal spacing to those in said air supply tube, said liquid supply tubes being located on opposite sides of said air orifices with each liquid orifice in said first liquid supply tube facing a corresponding liquid orifice in said second liquid supply tube, each set of facing liquid orifices being positioned in front of an air orifice and the spacing between each facing liquid orifices being less than the lateral dimension of the air orifice associated therewith.

4,648,268

METHOD OF DEFINING HOMOGENEOUS ROCK FORMATION ZONES ALONG A BOREHOLE ON THE BASIS OF LOGS

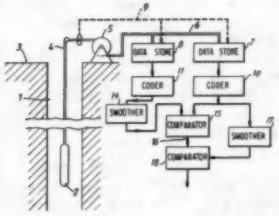
Yves H. Grosjean, Paris, France, assignor to TOTAL Compagnie Francaise des Petroles, Paris, France

Filed Sep. 24, 1985, Ser. No. 779,404

Claims priority, application France, Oct. 22, 1984, 84 16116

Int. Cl.⁴ E21B *49/00*

U.S. Cl. 73—152 **1 Claim**



1. A method defining final limits of homogeneous rock formation zones along a borehole on the basis of first and second logs by reproducing said logs in the form of rectangular zones forming crenellations, said first log being obtained in a first logging operation giving lithological information and the second log being obtained in a second logging operation giving information relative to the fluids impregnating the rock formation, comprising the steps of:

determining provisional first individual limits of homogeneous rock formation on said first log as obtained in the first logging operation before smoothing the crenellations of the same;

determining provisional second individual limits of homogeneous rock formation on said second log after smoothing the crenellations of the same;

defining as first final limits of homogeneous rock formation zones those ones of said first individual limits substantially equal to some of said second individual limits, and the second individual limits belonging to said second log only;

smoothing the crenellations of said first log; and

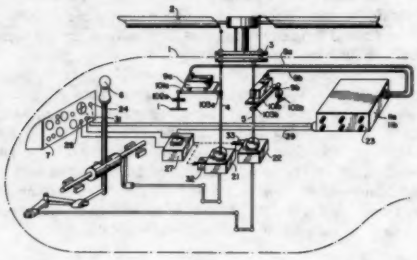
defining as second final limits of homogeneous rock formation zones the limits of said first individual limits still appearing after smoothing the crenellations of the first log and not appearing on said first final limits.

4,648,269

SPEED MEASURING DEVICE FOR A HELICOPTER

Bernard Durand, Chemin Vidal, Route d'Arles, 13300 Salon, France

Filed Jul. 3, 1985, Ser. No. 751,553
Claims priority, application France, Jul. 6, 1984, 84 10736
Int. Cl.[4] G01C *21/10*
U.S. Cl. 73—178 H **10 Claims**



1. A device for measuring, particularly near hovering flight speeds, the air speed of a helicopter comprising:

at least one lifting rotor and a cyclic rotor pitch control system operated by means of a control stick;

two substantially identical measuring devices connected to a dual indicator and responding, respectively, to the displacement of the helicopter along its longitudinal axis and along its transverse axis; and

computing means; wherein each measuring device comprises a single detector for detecting both the position of the cyclic rotor pitch control system along one of the longitudinal axis and the transverse axis and the acceleration component along the same axis, and wherein the computing means provides the integral of the output signal of the single sensor of each measuring device in order to provide the airspeed components of the helicopter in relation to the respective axes.

4,648,270

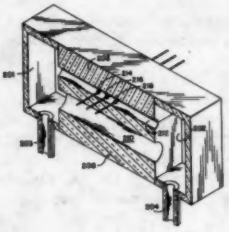
MASS FLOWMETER

Carl A. Johnson, and S. M. Boris Robinson, both of Somerville, Mass., assignors to Sirris Flow Technology, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 582,251, Feb. 22, 1984, abandoned. This application Jun. 17, 1985, Ser. No. 745,383
Int. Cl.[4] G01F *5/00, 1/68*
U.S. Cl. 73—202 **18 Claims**

1. In a mass flowmeter, for measuring fluid flow, said flowmeter having three thermistors arranged in a line parallel to said flow, means to heat the center of one of said thermistors and means to measure the resistance of the remaining two thermistors and means to form the difference of said resistance measurements, an improved transducer housing comprising,

a block of housing material having a detection channel therethrough, said block of housing material comprising two pieces, said detection channel being divided along an axis parallel to the direction of said flow so that a portion of said detection channel is located in each block piece, said three thermistors being located in said detection channel, and



a bypass channel through said transducer body containing a flow restricting device; and

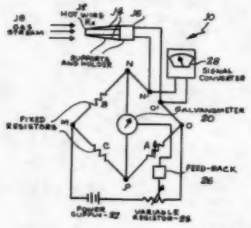
means connecting said bypass channel and said detection channel in parallel so that fluid flows through both channels simultaneously.

4,648,271

ANEMOMETER HAVING A GRAPHITE FIBER HOT WIRE

Lawrence D. Woolf, Carlsbad, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Filed Dec. 9, 1985, Ser. No. 806,761
Int. Cl.[4] G01F *1/68*
U.S. Cl. 73—204 **14 Claims**



1. A hot-wire anemometer comprising electrical resistance bridge means including a fiber hot wire resistor in one arm thereof that has a temperature-dependent resistance, said fiber hot wire being formed substantially of graphite, means for supplying electrical power to said fiber hot wire to internally heat the same, means for supporting a span of said hot wire in tension for exposure to a stream of flowing cooling gas, and signal converting means coupled to said bridge means for correlating the cooling effect on the hot wire resistance with gas flow velocity.

4,648,272

STRENGTH/WEIGHT MEASURING SCALE

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed Nov. 19, 1985, Ser. No. 799,600
Int. Cl.[4] A61B *5/22;* G01G *19/50*
U.S. Cl. 73—380 **7 Claims**

1. A scale selectively operative in a weighing mode to measure body weight, and in a strength mode to measure muscular strength, the scale comprising:

A a base restable on the ground;

B a depressible platform supported above the base;

C a transducer interposed between the platform and the base

to provide a signal indicative of the extent to which the platform in displaced relative to the base or vice versa;

D a converter coupled to the transducer to provide a readout;

E an upright post mounted on the base and extending through an opening in the platform, said post terminating in a handle which is elevated above the platform and can be grasped by one standing thereon; and

F selective means to prevent depression of the platform, whereby when these means are disabled in the weighing mode and the platform is depressed by a user standing thereon, the reading is that of body weight, and when these means are rendered operative in the strength mode, then one standing on the platform and pulling up on the handle to exert an upward force on the base, the reading will then be of strength and be independent of body weight.

4,648,273

FORCE RESPONSIVE DEVICE

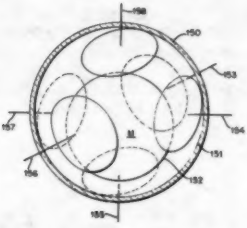
Karlis V. Ozols, 44 Thorne Ave., Mount Kisco, N.Y. 10549

Division of Ser. No. 511,507, Jul. 6, 1983, Pat. No. 4,528,851, which is a continuation-in-part of Ser. No. 236,874, Feb. 23, 1981, abandoned, which is a division of Ser. No. 965,784, Dec. 1, 1978, Pat. No. 4,312,227, which is a division of Ser. No. 790,045, Apr. 22, 1977, Pat. No. 4,138,600. This application May 23, 1985, Ser. No. 737,149

The portion of the term of this patent subsequent to Jan. 26, 1999, has been disclaimed.

Int. Cl.[4] G01P *15/08*

U.S. Cl. 73—516 LM **11 Claims**



1. A device adapted to detect the influence of a gravitational force on a body due to changes in a free-fall state, said device comprising:

a housing including a generally spherical center cavity;

a body of flow medium contained within said cavity, said body having a non-spherical shape in the presence of gravity, and said body being adapted to approach a spherical shape under the action of surface tension in response to an approach to zero gravity, said body further being free to move about said cavity as a function of changes in the free-fall state; and

a plurality of monitoring means spaced about the wall of said cavity and connected to an external monitoring circuit, said monitoring means being adapted to monitor the movement of said body about said cavity in order to indicate the presence of a gravitational force acting upon the device and the direction in which the gravitational force is being exerted.

4,648,274

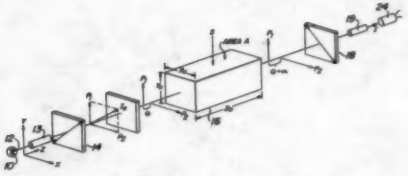
PHOTOELASTIC MEASURING TRANSDUCER AND ACCELEROMETER BASED THEREON

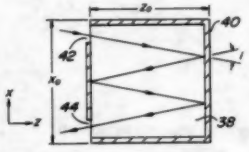
Michael N. Trainer, Telford, Pa., assignor to General Signal Corporation, Stamford, Conn.

Filed Aug. 7, 1985, Ser. No. 763,152

Int. Cl.[4] G01L *1/24;* **G01B** *11/18*

U.S. Cl. 73—517 R **14 Claims**





1. A photoelastic measuring transducer, comprising:

a photoelastic element which exhibits a degree of birefringence which varies in proportion to variations in the amount of stress applied along an axis of the element, said stress being proportional to the variable to be measured, said photoelastic element being constructed to provide multiple internal reflections of light beams solely in a plane of internal reflection substantially normal to the stress axis so as to lengthen the optical path in said element;

means for providing a single beam only of plane polarized light directed at said element at an angle for propagation through said element in said plane of internal reflection with its plane of polarization at an angle with the axis of said stress;

means for producing a phase difference between two perpendicular components of the polarized light beam one of which is along the stress axis;

polarizing analyzer means for passing a first quantity of luminous flux of the beam transmitted by said element and polarized in a plane perpendicular to the plane of polarization of said incident beam and a second quantity of luminous flux polarized in a plane parallel to the plane of polarization of said incident beam;

first and second photocells for converting said first and second quantities of luminous flux into corresponding first and second electrical signals proportional to said quantities; and

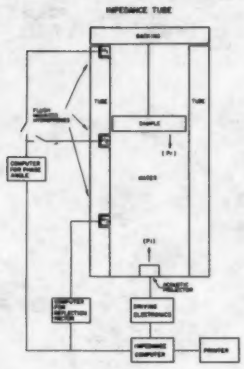
means for combining functions of said first and second electrical signals as required to calculate the magnitude of the variable to be measured.

4,648,275

UNDERWATER ACOUSTIC IMPEDANCE MEASURING APPARATUS

Jerome Goodman, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 30, 1985, Ser. No. 728,899
Int. Cl.[4] G01N 29/00
U.S. Cl. 73—589 1 Claim



1. An automated underwater acoustic impedance measuring apparatus comprising:

(a) a first transducer means positioned within said apparatus for producing and transmitting a plane wave,

(b) a second transducer means positioned within said apparatus for sensing incident signals and reflected signals of a sample material placed within the apparatus for reflection factor computation, said sample material having a face perpendicular to a propagation direction of the plane wave,

(c) a third transducer means positioned within said apparatus at a plane containing the face of the sample material for sensing combined incident waves and reflected waves for phase angle computation,

(d) computer means positioned and interfaced with said second transducer means and said third transducer means for automatically computing real time acoustic impedance in accordance with formula:

$$R=(Pr/Pi)^2,$$

and

$$[Pi(1+2R\ \mathrm{Cos}\ \theta+R^2)]^{\frac{1}{2}}$$

wherein:
R=reflection factor
Pr=reflected sound pressure
Pi=incident sound pressure
θ=phase angle of the acoustic impedance
obtained from the reflection factor derived from the second transducer means and obtained from the phase angle derived from the third transducer means, and

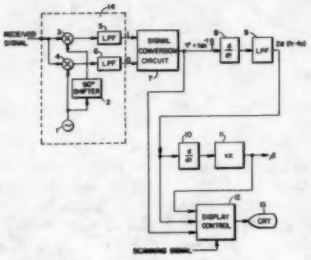
(e) indicating means for indicating said acoustic impedance.

4,648,276

APPARATUS FOR MEASURING THE CHARACTERISTICS OF AN ULTRASONIC WAVE MEDIUM

John R. Klepper, 3238 Twenty Third Ave., W., Seattle, Wash. 98199; John M. Reid, 722 Upper Gulph Rd., Strafford, Pa. 19087; Hirohide Miwa, 6-7-10, Miyazaki, Miyamae-ku, Kawasaki-shi, Kanagawa 213, Japan; Takaki Shimura, 29-44, Tsurukawa 4-chome, Machida-shi, Tokyo 194-01, Japan, and Keiichi Murakami, 17-305-2-8-6, Terasodai, Tama-ku, Kawasaki-shi, Kanagawa 214, Japan

Continuation-in-part of Ser. No. 574,690, Jan. 27, 1984, Pat. No. 4,534,220. This application Jun. 1, 1984, Ser. No. 616,472
Int. Cl.[4] G01N 29/00
U.S. Cl. 73—599 24 Claims



1. An apparatus for detecting characteristics of a medium using an ultrasonic wave pulse transmitted into the medium and received as a received signal after reflection by the medium, comprising:

signal distributing means, operatively connected to receive the received signal, for distributing the received signal into at least three received signal bands;

calculation means, operatively connected to said signal distributing means, for calculating a signal characteristic for each of the received signal bands from which a tissue characteristic can be derived;

averaging means, operatively connected to said calculation means, for averaging the signal characteristic of each of the received signal bands to produce an average signal characteristic; and

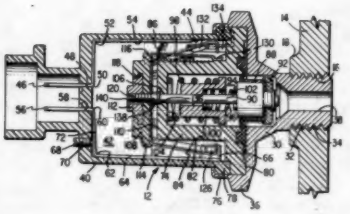
tissue characteristic means, operatively connected to said averaging means, for outputting the tissue characteristic derived from the average signal characteristic.

4,648,277

PRESSURE RESPONSIVE ASSEMBLY

George Obermann, Niles, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 12, 1985, Ser. No. 808,194
Int. Cl.[4] G01L 9/02
U.S. Cl. 73—725 9 Claims



1. A pressure responsive assembly for providing an analog

electrical signal indicative of a sensed pressure value and a switch change of state upon the sensed pressure crossing a predetermined threshold value, comprising:

an electrically insulated housing having a chamber therein, said chamber being defined by an interior wall;

a first conductive terminal member extending into said chamber along said interior wall;

a second conductive terminal member extending into said chamber along said interior wall, said second terminal member being spaced from said first terminal member and having a switch contact pad thereon;

an electrically insulated bobbin member extending into said chamber and spaced from said interior wall;

a resistance element on the outside of said bobbin member;

connecting means for electrically connecting an end of said resistance element to said first terminal member;

pressure sensing means having a member adapted for displacement relative to said bobbin member in response to magnitude variations of a sensed pressure;

a wiper assembly carried by said pressure sensing means member for movement therewith and including:

a first conductive finger adapted for wiping electrical contact with said resistance element; and

a second conductive finger adapted for wiping contact with said interior wall into and out of electrical contact with said switch contact pad as the magnitude of the sensed pressure crosses said predetermined threshold value; and

means for maintaining said wiper fingers at a reference voltage.

4,648,278

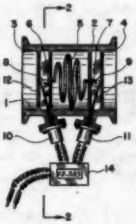
SPIRAL COIL TARGET FLOW METER

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Filed May 6, 1985, Ser. No. 730,854

Int. Cl.⁴ G01F *1/28*

U.S. Cl. 73—861.71 **14 Claims**



1. A spiral coil target flowmeter comprising in combination:

(a) a flowmeter body including a flow passage extending from one extremity to the other extremity of the flowmeter body;

(b) a spiral coil target comprising an elongated elastic member shaped into a spiral disposed within the flow passage in a substantially coaxial relationship wherein said spiral coil target is held in position in a prestressed state by a first load cell connected to one extremity of said spiral coil target and by a second load cell connected to the other extremity of said spiral coil target; and

(c) means for measuring the difference in load cell output between the two load cells as a measure of the fluid flow moving through said flow passage.

4,648,279

METHOD OF AND DEVICE FOR MEASURING FLOW RATE BY ELECTROMAGNETIC INDUCTION

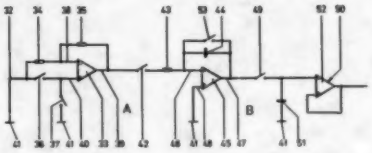
Ulrich Milsch, Bruchsal, and Wolf-Dieter Pohlig, Siedelsbrunn, both of Fed. Rep. of Germany, assignors to Bopp & Reuther GmbH, Mannheim, Fed. Rep. of Germany

Filed Jun. 24, 1985, Ser. No. 748,153

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1984, 3423076

Int. Cl.⁴ G01F *1/60*

U.S. Cl. 73—861.17 **11 Claims**



1. A method of measuring flow rate of an electrically conductive medium flowing through an electrically insulating pipe section, comprising the steps of exposing the medium flowing through said pipe section to electromagnetic fields generated by an exciter coil energized by a pulsating direct current; detecting periodically during selected pick-up time intervals (T_d) of uniform length measuring voltages induced in the medium by said electromagnetic field, said measuring voltages including a useful voltage component proportional to the flow rate of the medium and alternating current and direct current interference voltage components; setting the repetition rate (f_e) of said pulsating direct current so as to correspond to a double or a higher even integer multiple of a frequency (f_s) of said alternating current interference voltage component whereby during each period (T_s) of the alternating current interference voltage a group of four measuring voltages or of an integer multiple of four having a frequency corresponding to the repetition rate of said pulsating direct current, are detected; reversing the polarity of every second measuring voltage; and integrating during each period (T_s) of the alternating current interference voltage component the measuring voltages in said group whereby the alternating current and direct current interference voltage components are neutralized and sum of pure useful voltage components is obtained.

4,648,280

KARMAN VORTEX FLOWMETER

Noriomi Miyoshi, Kawasaki; Michihiko Tsuruoka, Sagamihara, and Mutsumi Nagumo, Musashino, all of Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Division of Ser. No. 439,900, Nov. 8, 1982, Pat. No. 4,584,883. This application Jan. 29, 1986, Ser. No. 823,998

Claims priority, application Japan, Nov. 10, 1981, 56-179071; Nov. 10, 1981, 56-179072; Apr. 22, 1982, 57-66330; Jun. 15, 1982, 57-102673; Jun. 15, 1982, 57-102674; Jun. 15, 1982, 57-102675; Jun. 15, 1982, 57-102676; Jun. 15, 1982, 57-102677; Jun. 15, 1982, 57-89364

Int. Cl.⁴ G01F *1/32*

U.S. Cl. 73—861.24 **3 Claims**

1. Apparatus including a Korman vortex generator for measuring the quantity of air inhaled by an internal combustion engine from the frequency of displacement of a vibrator member comprising

a pipe line for supplying inhaled air to the engine;

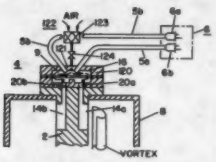
pillar means disposed in said line for generating Korman's vortex streets by being subjected to the inhaled air;

means forming a chamber outside said pipe line;

a plate member including a vibrator member positioned within said chamber for partitioning it into first and second portions, said first portion in communication with the pipe line for vibration of the plate member by the vortex

pressure generated by the pillar means, said second portion in communication with outside air by way of a restrictor and a filter for limiting the degree of communication and supplying a prescribed amount of outside air to said second portion; and

means for optically detecting the frequency of vibration of



said vibrator member located within the second portion of the chamber;

the chamber being adapted to be maintained at a negative pressure relative to the outside air by the inhaled air in the pipe whereby filtered outside air is drawn into the chamber for keeping clean the optical detecting means within the second portion of the chamber.

4,648,281

TURBINE FLOWMETER

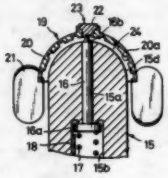
Yutaka Morita, Takarazuka; Masayoshi Katayama, Yokohama, and Takashi Kato, Kawasaki, all of Japan, assignors to Osaka Gas Co., Ltd. and Tokico Ltd., both of, Japan

Continuation-in-part of Ser. No. 695,836, Jan. 29, 1985, abandoned. This application Jun. 25, 1985, Ser. No. 748,497

Claims priority, application Japan, Jan. 30, 1984, 59-14924

Int. Cl.[4] G01F *1/10*

U.S. Cl. 73—861.91 **8 Claims**



1. A turbine flowmeter comprising:

a flowmeter housing through which a fluid to be measured flows;

a turbine rotor rotatably provided within said flowmeter housing, said turbine rotor comprising a rotor hub and a plurality of blades which are unitarily provided on said rotor hub;

bearing means for mechanically supporting said rotor hub in a rotatable manner by making mechanical contact with said rotor hub;

a stationary member provided in said flowmeter housing in an opposing manner to said rotor hub; and

dynamic pressure bearing means for building up a dynamic pressure bearing by said fluid between said rotor hub and said stationary member as said turbine rotor rotates so as to reduce the degree of bearing support by said bearing means, said turbine rotor being rotated in a predetermined direction, said dynamic pressure bearing means comprising a plurality of spiral grooves which are formed on a surface of said rotor hub facing said stationary member, each of said plurality of spiral grooves having a width which decreases from an outer periphery to a center of said rotor hub, each of said spiral grooves converging in a direction which is opposite to the rotating direction of said turbine rotor.

4,648,282

POWER SCREWDRIVER

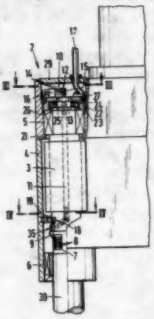
Wolfgang J. Alender; Heinz-Gerhard Anders, and Hermann J. Leuthner, all of Aalen, Fed. Rep. of Germany, assignors to Cooper Industries, Houston, Tex.

Filed May 10, 1985, Ser. No. 733,011

Claims priority, application Fed. Rep. of Germany, May 15, 1984, 8414766[U]

Int. Cl.[4] B25B *23/145*

U.S. Cl. 73—862.23 **11 Claims**



1. A power screwdriver with a drive motor whose drive shaft has a drive connection via a gear unit to an output shaft with which a bit can be driven, and with at least one transducer accommodated in a housing and serving to measure parameters during driving, such as torque and/or the rotation angle of the output shaft, wherein the transducer is rotationally rigidly connected to the output shaft and further includes means for transmitting electrical signals from said transducers to at least one slip ring and stationary sensor, said stationary sensor being part of a brush gear unit which is rotationally rigidly disposed in the housing by being situated on a covering nut which covers a free end of the output shaft and which is screwed into a threaded hole of said housing so that parameters such as torque and/or the rotation angle of the output shaft may be transmitted to a control mechanism.

4,648,283

GEAR SHIFT CONTROL MECHANISM

David A. Janson, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 5, 1984, Ser. No. 678,532

Int. Cl.[4] G05G *5/10, 9/12*

U.S. Cl. 74—477 **14 Claims**

1. A gear shift control mechanism comprising:

multiple shift rods directed substantially parallel to one another, each rod carrying a shift fork for axial movement;

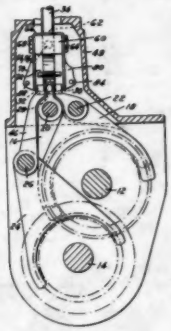
a shift lever supported for pivotal movement about a first axis directed parallel to the axes of the shift rods and for pivotal movement about a second axis directed substantially perpendicular to the axes of the shift rods, said lever being moveable about said first axis and said second axis into engagement with a selected shift fork;

interlock means located on each lateral side of the shift lever and mounted for pivotal movement about said first axis for blocking engagement with the shift forks;

detent means for holding the shift lever in multiple predetermined angular positions about the second axis; and

spring means located on a lateral side of the shift lever and

mounted for pivotal movement about the first axis into interference contact with the shift forks for producing a



force tending to resiliently bias the shift lever out of engagement with the selected shift fork.

4,648,284

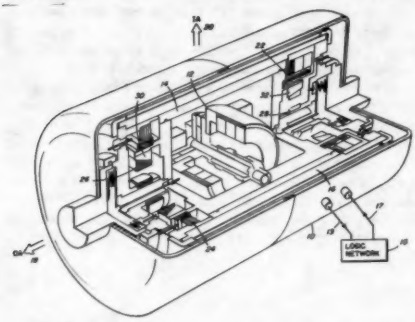
APPARATUS AND METHOD FOR REDUCING GYRO ACTIVATION TIME

John Bouchard, Canton, and Robin Ray, Sharon, both of Mass., assignors to Northrop Corporation, Hawthorne, Calif.

Filed Jun. 4, 1984, Ser. No. 617,228

Int. Cl.[4] G01C *19/20, 19/24*

U.S. Cl. 74—5.46 **2 Claims**



1. In an inertial instrument having a gyro wheel disposed in a float floated in a viscous fluid within a case having means for determining the location of the float within the case and including electromagnet means for centering said float at an equilibrium position with in said case, said electromagnetic means including electromagnets disposed on opposite sides of said case for interaction with magnetically permeable rings disposed on said float;

apparatus for speeding up the centering of said float comprising

circuitry for selectively disabling one of said electromagnets when said float exceeds a preselectable distance from said equilibrium position to speed up the centering and for re-enabling said one of said electromagnets when said float is within said preselectable distance from said equilibrium position.

4,648,285

APPARATUS FOR CONVERTING ROTATIONAL MOTION TO LINEAR MOTION

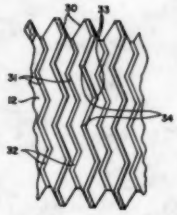
William W. Carson, Mendon, Mass., assignor to Millipore Corporation, Bedford, Mass.

Division of Ser. No. 466,283, Feb. 14, 1983, abandoned. This application May 16, 1985, Ser. No. 734,810

The portion of the term of this patent subsequent to Jul. 2, 2002, has been disclaimed.

Int. Cl.[4] F16H *25/22, 25/24*

U.S. Cl. 74—424.8 C **5 Claims**



1. Apparatus for converting rotational motion to linear motion which comprises a screw shaft having a screw shaft thread with at least one start, a nut surrounding said screw shaft, said nut having an inner surface and a nut thread having at least one start on said inner surface, said nut thread having a different number or direction of starts than the starts of the thread on said screw shaft and at least one threaded planetary roller interposed between and meshing with said nut thread and said screw shaft thread whereby concentricity between said screw shaft and said nut is maintained, and wherein said threads follow a generally helical path but change direction along said generally helical path.

4,648,286

BALL-RETAINING STRUCTURE IN A POWER TRANSMISSION APPARATUS

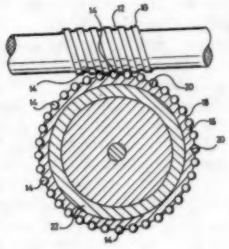
Isao Nemoto, Narashino, Japan, assignor to Nemoto Kikaku Kogyo Co., Ltd., Chiba, Japan

Filed Mar. 5, 1985, Ser. No. 708,424

Claims priority, application Japan, May 28, 1984, 59-78265[U]

Int. Cl.[4] F16H *1/16, 55/10*

U.S. Cl. 74—425 **3 Claims**



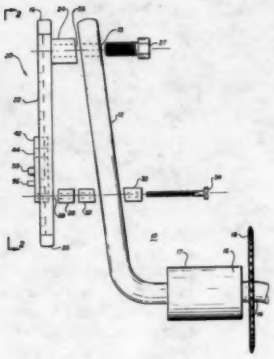
1. A ball-retaining structure in a power transmission apparatus for transmitting a power by means of magnetic balls, such as iron balls, arranged between an input rotating body and an output rotating body of non-magnetic material, the input rotating body being a worm and the output rotating body being a worm wheel, and magnetic means is arranged within said worm wheel to retain said balls on said worm wheel.

4,648,287

PEDAL STROKE ADJUSTER FOR A BICYCLE OR EXERCISE MACHINE

Jay Preskitt, 537 Redwood Ave., Milpitas, Calif. 95035

Filed Oct. 5, 1983, Ser. No. 539,537
Int. Cl.[4] G05G 1/14
U.S. Cl. 74—594.1 5 Claims



1. A pedal stroke length adjuster for a bicycle or exercise machine, wherein said bicycle or exercise machine has a drive means for converting pedal pressure into a propulsion force, said drive means having a bearing housing and a crank means having a pair of crank arms and a spindle therebetween, said crank arms extending in opposite directions from said spindle that is journaled in said bearing housing, which pedal stroke length adjuster comprises:

means for adjusting the length of the pedal stroke of the pedal stroke length adjuster to a plurality of selectable lengths, wherein said means for adjusting comprises:

a crank frame including a pair of crank frame sides in each of which an edge thereof forms a guide rail, and a pair of end plate members holding the crank frame sides together with the guide rails of said sides being parallel to each other and in the same plane;

pedal mounting and adjuster means adapted to ride on said guide rails for adjusting the pedal stroke including a mounting block having grooved sides adapted to slideably fit between said guide rails; and

means for holding said pedal mounting and adjuster means in a plurality of selectable positions including at least one spring-loaded detent mechanism for driving a latch member out from the side of said mounting block and against a guide rail, and wherein at least one guide rail, which is adjacent said latch member of said detent mechanism, includes a plurality of spaced apart notches into which said latch may be seated, whereby the stroke length is fixed in a selected position;

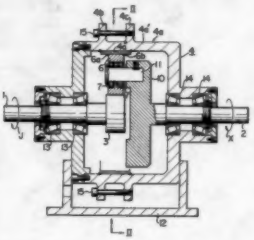
means for attaching said pedal stroke length adjuster upon a crank arm of said drive means without physical modification of said crank arm.

4,648,288

POWER TRANSMITTING DEVICE

Heizaburou Kato, Ichikawa, and Masao Anma, Shizuoka, both of Japan, assignors to Sankyo Manufacturing Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 666,583, Oct., 1984, abandoned. This application Jul. 24, 1986, Ser. No. 887,975
Claims priority, application Japan, Nov. 1, 1983, 58-168458[U]
Int. Cl.[4] F16H 15/50, 13/10
U.S. Cl. 74—798 3 Claims



1. A power transmission device comprising a first rotary shaft and a second rotary shaft which are arranged coaxially, a sun roller connected to said first rotary shaft, a stationary outer ring disposed concentrically with said sun roller, said outer stationary ring and the casing of said power transmission device formed as one singular piece, and a plurality of planet rollers disposed in the annular space between said sun roller and said stationary outer ring, said planet rollers being carried by a carrier rotatable as a unit with said second rotary shaft, a pair of mutually opposing flange-like projections formed on the outer peripheral surface of said stationary outer ring and casing structure so as to pass positions adjacent to respective axial ends of the area of contact between said planet rollers and said stationary outer ring; and tightening means operable from the outside of said transmission casing structure and urging said flange-like projections towards each other to cause an elastic deformation of said stationary outer ring; said tightening means comprising a plurality of tightening bolts which are screwed to threaded holes in one of said flange-like projections through holes formed in the other of said flange-like projections wherein substantially only radial forces are being applied inwardly from said elastically deformed stationary outer ring upon said planet rollers whereby the levels of contact pressure between said sun roller and said planet rollers and between said planet rollers and said stationary outer ring are adjustable through adjustment of amount of tightening by said tightening means.

4,648,289

IDLING CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION PROVIDING ANTI ROLL BACK ACTION

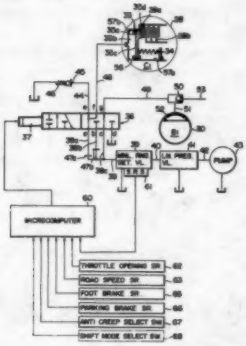
Seitoku Kubo; Yutaka Taga, and Shinya Nakamura, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 26, 1985, Ser. No. 769,324
Claims priority, application Japan, Aug. 24, 1984, 59-176300
Int. Cl.[4] B60K 41/18, 41/16
U.S. Cl. 74—866 6 Claims

1. An idling control system for an automatic transmission system for a vehicle equipped with an engine, said automatic transmission system comprising a gear transmission mechanism which comprises: a power output shaft, a forward clutch which is engaged when said gear transmission mechanism is engaged to a forward speed stage, a one way clutch which in cooperation with said forward clutch provides a first speed stage by means of rotation prevention, and a brake which,

when engaged, in cooperation with said one way clutch prevents said power output shaft of said gear transmission mechanism from rotating in the direction to allow reverse motion of said vehicle, comprising:

a first means for engaging said forward clutch selectively either to a maximum amount or to an intermediate amount substantially lower than said maximum amount;



a second means for engaging said brake, when said forward clutch is thus engaged to said intermediate amount by said first means; and

a third means for, when said automatic transmission is being operated in a forward driving mode, said vehicle is substantially stationary, and said engine is in substantially idling condition, actuating said first means to engage said forward clutch to said intermediate amount and said second means to engage said brake.

4,648,290

SEMI-AUTOMATIC MECHANICAL TRANSMISSION CONTROL

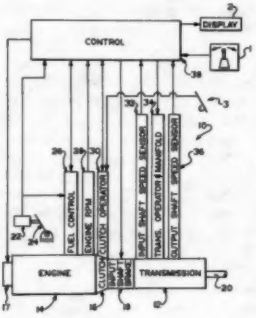
Michael W. Dunkley, Preston, and John E. Stainton, Chorley, both of England, assignors to Eaton Corporation, Cleveland, Ohio

Filed Jul. 16, 1985, Ser. No. 755,628

Claims priority, application United Kingdom, Jul. 23, 1984, 8418749

Int. Cl.[4] B60K *41/18, 41/10*

U.S. Cl. 74—866 **22 Claims**



1. A method of controlling a semi-automatic mechanical change gear transmission system comprising a manual fuel throttle control, a fuel throttle controlled engine, a multi-speed change gear mechanical transmission, a friction master clutch interposed the engine and transmission, a manual clutch control for selectively engaged and disengaging the master clutch, a manually operated shift selection lever moveable in a first direction from a centered position to select upshifts and in a second direction from said centered position to select downshifts from the currently engaged gear ratio, a central processing unit for receiving inputs indicative of transmission input shaft and output shaft rotational speeds, and operation of said shift selection lever and for processing same according to predetermined logic rules to issue command output signals to non-manually controlled operators including a clutch operator, a fuel throttle control operator, and a transmission operator, the method of controlling characterized by;

processing said input signals to determine the currently engaged gear ratio of said transmission and to determine permissibly engaged gear ratios of said transmission under sensed vehicle operating conditions;

sensing operation of said manual shift selection lever including the direction of movement thereof and the number of displacements of said lever within a predetermined period of time from said centered position;

determining the transmission gear ratio selected by the operator to be shifted directly into from the currently engaged ratio by assuming each repetition of displacement from the centered position of said shift selection lever in a given direction indicates operator selection of a change of one additional consecutive ratio in said direction and,

issuing command output signals to cause an automatic upshift or downshift from the currently engaged gear ratio to the least displaced gear ratio from currently engaged gear ratio of (1) the operator selected gear ratio or (2) the most displaced from currently engaged ratio of the permissible gear ratios in the selected direction of shifting, said command output signals causing said transmission to be shifted directly from said currently engaged gear ratio to said least displaced gear ratio.

4,648,291

TRANSMISSION CONTROL APPARATUS AND METHOD FOR DETERMINING SHIFT SIGNALS ON DOWNHILL SLOPES

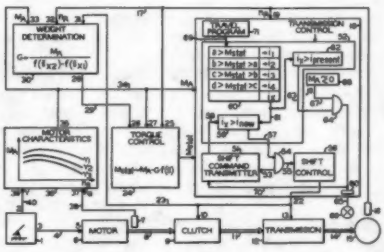
Alfred Klatt, Wathlingen, and Erich Reinecke, Burgdorf, both of Fed. Rep. of Germany, assignors to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Sep. 26, 1984, Ser. No. 654,815

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1983, 3334718

Int. Cl.[4] B60K *41/18*

U.S. Cl. 74—866 **11 Claims**



1. An on vehicle apparatus to determine transmission gears engageable on a vehicle traversing a downhill grade of a roadway, said apparatus comprising:

(a) a means positioned on such vehicle for generating a first signal having a value representative of an instantaneous drive torque (M_A) of such vehicle;

(b) a means positioned on such vehicle for generating a

second signal having a value representative of a constant speed drive torque (M_{stat}) of such vehicle;

(c) a first comparator means connected to receive said value of said second signal for comparing said value of said second signal with a function which correlates a relationship between said values of M_{stat} with a steepness of a downhill grade and for generating a third signal having a value representative of a gear ratio that will provide a predetermined braking effect by a motor of such vehicle;

(d) a means for determining if said M_d drive torque is tending to retard said vehicle and for generating a fourth signal representative of said retarding drive torque;

(e) a comparator means connected to receive said value of said gear raio signal for comparing said value of said gear ratio signal with a value representative of an engaged gear ratio and for generating a fifth signal when said value of said engaged gear raio is less than said value of said gear ratio signal; and

(f) a logic AND element connected to receive said fourth signal and said fifth signal for generating a sixth signal indicative of a gear change that will maintain said predetermined motor braking effect when both said fourth signal and said fifth signal are simultaneously received by said logic AND element.

4,648,292

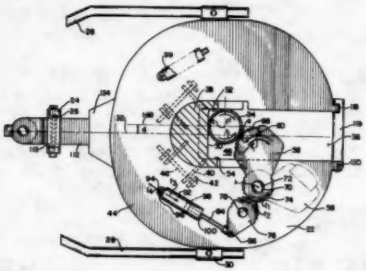
TONG ASSEMBLY

Charles W. Haynes, Marshall, and Frank W. Gault, Houston, both of Tex., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Continuation of Ser. No. 591,077, Mar. 19, 1984, abandoned. This application Jan. 13, 1986, Ser. No. 818,062

Int. Cl.[4] B25B *28/00*

U.S. Cl. 81—57.16 **13 Claims**



1. A tong assembly for makeup and break down of a threaded tubular tool joint having an upper section, a lower section and a central axis, comprising:

a power tong having a longitudinal axis and means for gripping and rotating said upper section of said tool joint;

a backup tong positioned below said power tong, said backup tong having a longitudinal axis, a bushing including a rear flat surface and two flat side surfaces, a first die having first teeth and first means for engaging said first die teeth with said lower section of said tool joint such that upon application of torque by said power tong to rotate said upper section in one direction said backup tong moves through a limited rotation relative to said power tong and said lower section is fixedly retained among said first die teeth, said rear surface and one of said side surfaces, and is positioned with said central axis of said tool joint at a first position spaced to one side of said longitudinal axis of said backup tong, said backup tong also having a second die having second teeth and second means for engaging said second die teeth with said lower section of said tool joint such that upon application of torque by said power tong to rotate said upper section in the opposite direction said backup tong moves through a limited rotation relative to said power tong and said lower section is fixedly retained among said second die teeth, said rear surface and the other one of said side surfaces, and is positioned with said central axis of said tool joint at a second position spaced to the other side of said longitudinal axis of said backup tong; and

means for interconnecting said power tong and backup tong and for supporting one from the other, said interconnection means allowing said limited rotations of said backup tong, in a plane perpendicular to said central axis of said tool joint, relative to said power tong.

4,648,293

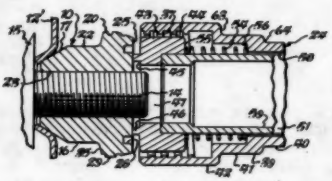
LOCKNUT AND KEY THEREFOR

Lewis D. McCauley, Eggertsville, N.Y., assignor to McGard, Inc., Buffalo, N.Y.

Filed Jun. 10, 1983, Ser. No. 502,980

Int. Cl.[4] B25B *13/48*

U.S. Cl. 81—436 **17 Claims**



1. In combination a locknut and a key therefor, said locknut including a locknut body portion having a threaded axial bore therein, a first portion on said locknut body portion for engaging an external member, a face on said locknut body portion extending transversely to said threaded axial bore, a groove of predetermined configuration in said face, a second portion on said locknut body portion including a relatively short substantially cylindrical first helical thread, a relatively steep lead-in portion to said first helical thread on said locknut body portion, and a second helical thread with a gradually increasing outer diameter on said lead-in portion, said key including a key body portion, flange members of said peredetermined configuration on said key body portion for reception in said groove, said key including a housing, a third helical thread on said housing for locking engagement with said substantially cylindrical first and second helical threads, and engagement means on said housing and said key body portion for maintaining said flange means in engagement with said groove when said first and second and third helical threads are in locking engagement.

4,648,294

METHOD AND APPARATUS FOR MACHINING A GROOVE AROUND A TUBULAR MEMBER

Alain Jacquot, and Jacques Charpentier, both of Tours, France, assignors to SKF Compagnie d'Applications Mechaniques, Clamart and Framatome, Courbevoie, both of, France

Continuation of Ser. No. 446,818, Dec. 3, 1982, abandoned. This application Aug. 7, 1985, Ser. No. 763,756

Claims priority, application France, Dec. 7, 1981, 81 22870

Int. Cl.[4] B23B *5/00*

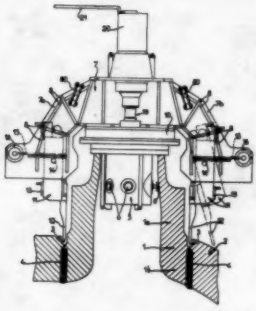
U.S. Cl. 82—4 R **21 Claims**

1. An apparatus for machining an annular groove around an external portion of a radially extending base of tubular member, said tubular member having said base at one end and having a transverse end surface at its other end, comprising:

(a) a drum adapted to be inserted within said tubular member, a set of locking shoes mounted on said drum, and hydraulic ram means for extending the locking shoes in a substantially radial plane into contact with the inner sur-

face of said tubular membear to lock and position said drum within the tubular member;

(b) an annular plate means connected to said drum, said annular plate means extending radially outwardly from said drum for engaging said transverse end surface of said tubular member, means for securing said annular plate means to said transverse end surface of said tubular member, said securing means including cooperating members mounted respectively on the annular plate and on the transvere end surface of the tubular member, fasteners for connecting said cooperating members together, and means which are radially adjustable with respect to said



tubular member and are operable to retain the annular plate means at a precise radial position with respect to said tubular member, said annular plate means being operable to hold the drum at a precise axial position within the tubular member;

(c) a machining head section supported for rotary motion relative to said drum, said machining head section being fitted with an adjustable tool-holder element;

(d) a driving means for rotating said machining head section, said driving means including a ring gear, rolling bearing elements on said ring gear, and a planet wheel engaged with said ring gear.

4,648,295

METHOD FOR PRODUCING WORKPIECES HAVING POLYGONAL OUTER AND/OR INNER CONTOURS AND APPARATUS FOR IMPLEMENTING THE METHOD

Hans Ley, Dr. Wirtz-Str. 3, D-5203 Much; Udo Neumöck, Hermann-Krausen-Str.41; Scholz, Peter, Heinrich-Hoerle-Str. 4, both of D-5000 Köln 60; Seidler, Horst, Heckhaus 40, D-5203 Much; Horst Berghaus, Steinenbrückerstr. 1, D-5200 Lindlar 3, and Manfred Schmidt, Krahmerweg 11, D-5203 Much, all of Fed. Rep. of Germany

PCT No. PCT/EP83/00159, § 371 Date Feb. 17, 1984, § 102(e) Date Feb. 17, 1984, PCT Pub. No. WO84/00018, PCT Pub. Date Jan. 5, 1984

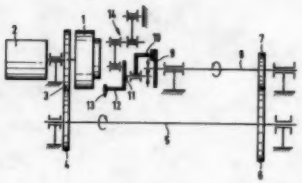
PCT Filed Jun. 18, 1983, Ser. No. 589,100

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1982, 3222991

Int. Cl.[4] B23B *1/00, 5/44*

U.S. Cl. 82—18 **28 Claims**

1. Method for shaping a workpiece to produce a polygonal outer and/or inner contour, comprising: rotating the workpiece at a constant speed about a first stationary axis of rotation; displacing a shaping tool cyclically on a closed circular path about a second axis of rotation spaced from the first stationary axis of rotation so that the closed circular path is eccentric to the stationary axis of rotation; causing the rate of rotation of the workpiece and the speed at which the tool is displaced on its circular path to be dependent upon one another; causing the tool to engage the workpiece over at least a portion of the path of displacement of the tool so that the workpiece is shaped by superposition of the rotational movement of the workpiece and the displacement of the tool on its closed circular path; and varying the displacement speed of the



tool during each displacement cycle according to a law of motion determined by the desired polygonal contour, by the action of movement control means controlling the speed of displacement of the tool according to the law of motion.

4,648,296

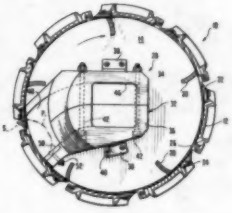
METHOD AND APPARATUS FOR FEEDING SLICERS

Lawrence W. Wisdom, Dallas, and Poonattu K. Joseph, Irving, both of Tex., assignors to Frito-Lay Inc., Dallas, Tex.

Filed Nov. 26, 1984, Ser. No. 675,010

Int. Cl.[4] B26D *3/28*

U.S. Cl. 83—13 **7 Claims**



1. A method of feeding a centrifugal slicer of the type having a rotary impeller with a plurality of blades, which impeller cooperates with a stationary member having a plurality of slicing knives, the method comprising:

(a) feeding a plurality of produce items vertically and downwardly in a single file line and in abutting relationship towards the center of the cup-like impeller and then along an inclined path from a vertical direction to a horizontal direction, while

(b) forcing the first in line of the single file line of produce items to the periphery of the rotary impeller.

4,648,297

METHOD AND APPARATUS FOR CROPPING THE LEADING AND TRAILING ENDS OF FAST-TRAVELLING ROLLED GOODS

Nils L. Lundgren, Malmö , Sweden, assignor to Centro-Morgardshammar AB, Smedjebacken, Sweden

Filed Jun. 18, 1985, Ser. No. 746,056

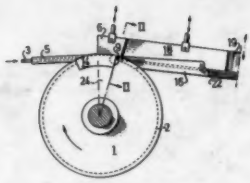
Claims priority, application Sweden, Jul. 9, 1984, 8403634

Int. Cl.[4] B23D *25/04*

U.S. Cl. 83—27 **10 Claims**

1. A method for cropping the front and tail ends of fast-travelling rolled goods (3), comprising leading the rolled goods into a guide-groove (2) extending around the periphery of a circular disc (1), rotating said disc at a peripheral speed corresponding to the speed of the rolled goods and, while positively guided in this position, causing the rolled goods to accompany the disc over a sector (24), squeezing said rolled goods, while still firmly guided in the guide-groove, in the axial direction of the disc, cutting off said rolled goods at the

end of said sector by means of a cutting device (4) mounted on the disc and movable transversely to the guide groove, and



leading the separated end pieces (22) of the rolled goods in one direction and the cropped rolled goods (23) in another direction.

4,648,298

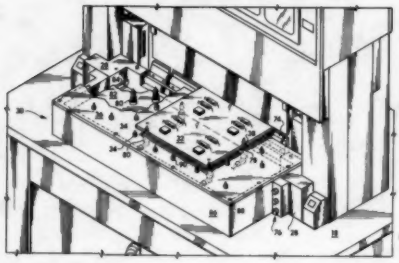
IN-LINE SHEARING DEVICE

David W. Sutton, Boulder, Colo., assignor to Hero Automation, Boulder, Colo.

Filed May 20, 1985, Ser. No. 735,843

Int. Cl.[4] B26D *1/08*

U.S. Cl. 83—62 **20 Claims**



1. A shearing device for shearing printed circuit board disposed in a substantially horizontal plane comprising:

upper blade means movable along a predetermined substantially vertical plane;

lower blade means disposed in an orientation substantially parallel to said predetermined substantially vertical plane to provide clearance for components mounted on said printed circuit boards while maintaining blade strength of said lower blade means in the direction of movement of said upper blade means in said predetermined vertical plane;

location tooling means substantially horizontally displaced from said lower blade means and having tooling pins which are inserted through and engage holes located in said printed circuit boards and substantially horizontally displaced from said lower blade means to hold and support said printed circuit boards substantially horizontally during cutting on a supporting surface adjacent said tooling pins of said location tooling means so as to reduce scrap portions sheared from said printed circuit board;

lower blade holder means for structurally supporting said lower blade means in said orientation substantially parallel to said predetermined substantially vertical plane to provide sufficient clearance for components mounted on said printed circuit to allow substantially zero space cutting of said printed circuit boards adjacent said components mounted on said printed circuit boards;

means for precisely aligning forces applied to said upper blade means with said lower blade means during shearing and preventing generation of lever arm forces between said upper blade means and said bearing means.

4,648,299

APPARATUS FOR CUTTING OFF A TEAR-OPEN STRIP

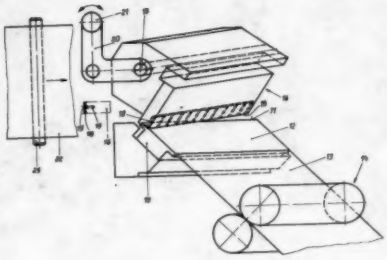
Knecht Siegfried, Gevelsberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Alfred Schmermund GmbH & Co, Gevelsberg, Fed. Rep. of Germany

Filed Jun. 17, 1985, Ser. No. 745,604

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1984, 3423295

Int. Cl.[4] B65B *61/18*; B26D *1/30*

U.S. Cl. 83—150 **13 Claims**



1. An apparatus for severing a tear-open strip from a band of material with a width equal to the length of said strip and for applying said strip to an intermittently conveyed web of packaging material which extends substantially transversely relative to said band comprising:

two knife means for cooperatively cutting a said strip from a said band, said knife means each being provided with a cutting edge, one of said knife means being stationary and housing a support and guide surface for said band and the other of said knife means having a longitudinal axis and being movable with respect to said stationary knife means for severing said strip from said band, said other knife means having openings in a surface adjacent to its cutting edge, said openings being subjected to suction for holding and transporting said severed strip, wherein said cutting edges of said knife means form chords of a hyperboloid of revolution and are inclined relative to each other to provide a drawing-type cutting of said strip from said band;

means for pivoting said movable knife means through a predetermined angle about a longitudinal axis of said movable knife means, said longitudinal axis being arranged such that at one end position of pivot of the movable knife means said surface having said openings is in the plane of said web, and at the other end position of pivot said movable knife means presents a cutting edge inclined relative to the cutting edge of the stationary knife means for cooperating therewith to begin the draw-down severing of said strip; and

means for displacing said movable knife means during its travel from the first end position to the other end position so that said cutting edges are out of engagement during said travel.

4,648,300

BISCUIT CUTTING APPARATUS

Harold E. Hassenfelt, Jr., 565 E. Indiana Ave., Southern Pines, N.C. 28387

Filed Jun. 6, 1985, Ser. No. 741,906

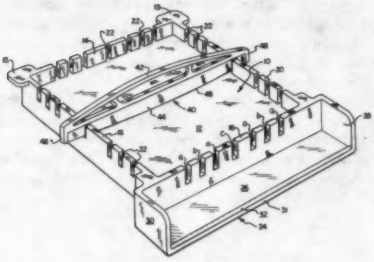
Int. Cl.[4] B26D *1/02*

U.S. Cl. 83—762 **12 Claims**

1. Apparatus for rolling and cutting biscuit dough comprising:

(a) a planar cutting surface;

(b) a rectangular frame surrounding said cutting surface and forming a dough compartment, said frame including a plurality of side walls of a height substantially equal to the thickness of biscuit dough to be formed;
(c) each of said side walls including a plurality of vertical slots of a prescribed width therein extending from the top of said walls down to said planar cutting surface;
(d) a separate cutting blade having a length greater than the distance between opposed side walls and a thickness less



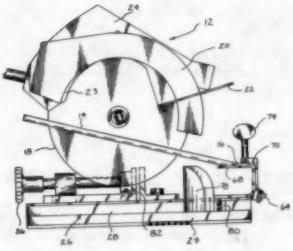
than the width of said slots, whereby the blade may be inserted in corresponding slots in opposed walls and manipulated back and forth to sever the biscuit dough thereunder;
(e) said plurality of slots being so arranged in such a prescribed pattern that a plurality of different sets of equal width cuts may be made along each side wall; and
(f) a flour trough extending outwardly from one of said side walls, said flour trough being of a length greater than the corresponding length of said cutting blade.

4,648,301

ADAPTER FOR CIRCULAR SAW TO CUT-OFF SAW

Paul C. Scott, Omaha, Nebr., assignor to L Investments, Ltd., Omaha, Nebr.

Filed May 20, 1985, Ser. No. 735,615
Int. Cl.[4] B27B *9/04*
U.S. Cl. 83—464 **12 Claims**



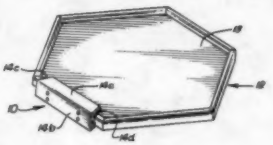
1. An adapter for a portable circular saw having a flat horizontal slide base within which a circular saw blade of the circular saw interfits, said adapter having clamp means for supporting said circular saw on said adapter for use as a cut-off saw or chop-saw for cutting off pieces from a work piece supported by said adapter, said adapter being comprised of a flat base supportable upon a work surface such as a table or the like, adjustable vise means for supporting said work piece cross-wise above said base, said base having a top surface supporting said vise means and side walls of a substantial height to provide substantial clearance of the work piece above the work piece in a cutting operation, a clamp means support member hingedly connected to said adapter base, said clamp means comprising a clamp element having a U-shaped throat receiving in end seated and load bearing relation a fornt end of the slide base of the circular saw in a generally upstanding rest position and in a genenally horizontally extending cutting position over the work piece in a cutting position and clamp tightening means for clipping the slide base in said throat, the throat of the clamp element extending cross-wise of the adapter base parallel to a hinged connection of the clamp element to the base and being comprised of a pair of plate member spaced from one another defining said throat.

4,648,302

ELECTRONIC DRUM RIM

Terry Bozzio, 449 S. Beverly Dr., Ste. 102, Beverly Hills, Calif. 90212

Filed Jul. 1, 1985, Ser. No. 750,306
Int. Cl.[4] G10H *3/12*
U.S. Cl. 84—1.04 **22 Claims**



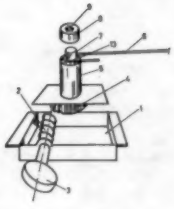
1. An electronic sound source for use at a rim portion of a drum, comprising
a striking element;
attachment means, connected to said striking element, for attaching said striking element to said rim portion, said attachment means including acoustic isolating means for providing an acoustically isolating connection between the striking element and the drum; and
transducer means, acoustically coupled to the striking element, for converting impact induced vibrations in the striking element into an electrical output signal.

4,648,303

DEVICE ON A STRING TIGHTENER FOR STRINGED INSTRUMENTS

Jan Braathen, Olav Kyrres gate 9A, N-0273 Oslo 2, and Kristian Bryn, Langs linjen 4, N-1170 Oslo 11, both of Norway

Filed Jun. 24, 1985, Ser. No. 748,202
Claims priority, application Norway, Jul. 5, 1984, 842738
Int. Cl.[4] G10D *3/14*
U.S. Cl. 84—306 **6 Claims**



1. A rotatable tuning mechanism for a stringed musical instrument of the type having a fingerboard, a string supporting ledge, and strings, said tuning mechanism comprising:
a tuning peg;
a means for rotating said tuning peg to tension a string connected thereto;
said tuning peg comprising a first portion rotatably coupled

to said rotating means, a threaded portion, a second portion adjustably connected to said first portion by said threaded portion, and a ring portion surrounding said threaded portion intermediate said first and second portions; said first, second, threaded, and ring portions having a common axis which extends outwardly from said rotating means; said second portion and said ring portion having mating planar, parallel surfaces for gripping said connected string, whereby the height of said ring portion is selectable to vary the angle of incidence of said connected string from said string supporting ledge to said tuning peg.

4,648,304

TREMOLO DEVICE FOR A GUITAR

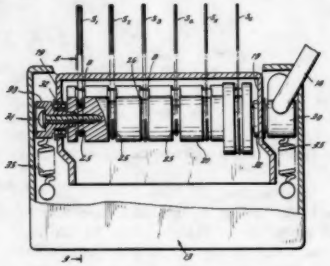
Yoshiki Hoshino, and Kazuhiro Matsui, both of Aichi, Japan, assignors to Hoshino Gakki Co., Ltd., Japan

Filed Sep. 13, 1985, Ser. No. 775,750

Claims priority, application Japan, Jan. 18, 1985, 60-8049

Int. Cl.[4] G10D *3/00*

U.S. Cl. 84—313 **14 Claims**



1. A tremolo device for a stringed instrument having a plurality of strings, the strings each having a diameter different from the others and the tremolo device including

a bridge structure mounted on the instrument and comprising a rotatable reelable member extending transversely of the strings; an arm connected to the reelable member for rotating the reelable member for producing a tremolo effect;

means for mounting the strings on the reelable member comprising a curved member on the reelable member individual to each string and each curved member being separate and replaceable and containing an anchor for its string and the strings each passing over the respective arcuate member individual to that string, said arcuate members each having different sized curvatures with their circumferences varying in length in a relative proportion to the diameter of the respective string whereby rotating the reelable member back and forth around its axis rotates all of the curved members and thereby causes a variation in tension of each string related to the relative diameter of each string.

4,648,305

ARMORED VEHICLE FOR SUPPLYING AMMUNITION TO A SELF-PROPELLED ARTILLERY WEAPON

Harold Elspass, Kaarst, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 24, 1984, Ser. No. 644,067

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1983, 3332225

Int. Cl.[4] F41H *7/02*; F41F *9/00, 9/02*

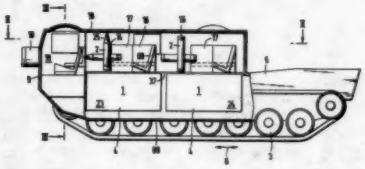
U.S. Cl. 89—36.08 **17 Claims**

1. An improved self-propelled a.t.a. vehicle for transporting ammunition including ammunition moved by a motor driven conveyor having elevating means for selectively vertically moving ammunition units stored in said a.t.a. vehicle, motor-driven first ammunition unit conveying means for selectively conveying said ammunition units deposited by said elevating means thereon through an opening in said a.t.a. vehicle towards a second weapons carrier armored vehicle, said a.t.a. vehicle also including a crew chamber for accommodating a crew for said a.t.a. vehicle, the improvement comprising

(a) vehicle transport means for moving said a.t.a. vehicle on the ground, a storage chamber disposed in the bottom region of said a.t.a. vehicle between said vehicle transport means and in the middle region of said a.t.a. vehicle;

(b) at least one ammunition unit elevating mechanism of said elevating means is operatively mounted in said a.t.a. vehicle for movement relative to said a.t.a. vehicle in the longitudinal and transverse direction;

(c) said first conveying means including a conveying mechanism which is reciprocally slidably operatively mounted in said a.t.a. vehicle above said storage chamber and which extends parallel to the longitudinal axis of the a.t.a. vehicle, and pipe means being mounted on the front side



of said a.t.a. vehicle in communication with said opening, said conveying mechanism is slid forwardly through said opening and said pipe means towards a weapons carrier armored vehicle, said pipe means rendering armor-protection to the ammunition units being tranported therethrough;

(d) control means operatively connected to said elevating mechanism and conveying mechanism for lifting preselected ammunition units from said storage chamber and transporting them through said pipe means;

(e) said elevating mechanism extending into an upper region of said chamber which forms an operations chamber for said a.t.a. vehicle, said same upper region also forms an auxiliary crew chamber during travel of said a.t.a. vehicle; and

(f) said a.t.a. vehicle having a crew chamber disposed above and in front of said storage chamber and said a.t.a. vehicle having a front wall and roof which define said crew chamber.

4,648,306

COUNTER RECOIL MECHANISM, PREFERABLY FOR AN ARTILLERY WEAPON

Erich Zielinski, Haan, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Jan. 11, 1984, Ser. No. 569,982

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1983, 3302039

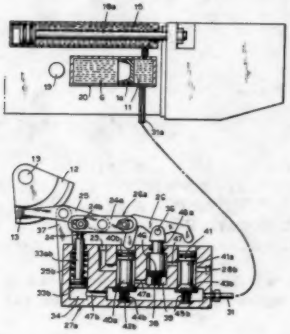
Int. Cl.[4] F41F *19/14*

U.S. Cl. 89—43.02 **3 Claims**

1. An improved hydropneumatic recuperator arrangement for a counter recoil mechanism of an artillery weapon, having a first cylinder which is mounted on the cradle frame of the weapon, said first cylinder has disposed therein a first piston, and has means operatively connected to the gun barrel of the weapon, which means alternately compress and decompress a gas in a second cylinder, a second piston being disposed in said second cylinder and said second cylinder being in communication with the recuperator of the weapon, the improvement comprising in combination,

said recuperator includes

a first piston slidably mounted in said first cylinder, said first cylinder containg
a fluid which is compressed, and then decompressed, by said first piston;
said second piston being slidably mounted in said second cylinder so as to divide said second cylinder into
two variable chambers, said second cylinder being in fluid communication with said first cylinder,
a first chamber of said second cylinder having
a volume which automatically varies in accordance with the elevation of the gun barrel of the weapon in such way that it displaces said second piston so that with reduced gun barrel elevation, fluid pressure is applied via the first cylinder to reduce the counterrecoil force on the gun barrel and with increased gun barrel elevation acting to increase the counterrecoil force acting on the gun barrel, said second piston is
a displacement piston; and
control valve means operatively connected, on the one hand, to the gun barrel, and on the other hand, to said second cylinder to displace said second piston in accordance with the elevation of the gun barrel;
said control valve means coact with
a first lever which is pivotally mounted on
a non-movable part of the weapon,
a roller is mounted at one free end of said lever,



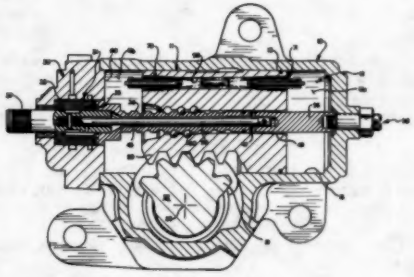
cam means disposed in the trunnion of the gun barrel and coacting with said roller so as to displace said second piston in said second cylinder in accordance with the elevation of the gun barrel; the other end of said lever being pivotally connected to
a second lever, said control valve means including
a housing having
four bores and
four piston reciprocally mounted in said four bores, said first chamber of said second cylinder being in communication with
a first bore of said four bores; the piston in a second bore of said four bores pivotally supporting
a third lever; said second and third levers being mutually pivotally connected to each other by
a first pin-and-slot connection at one end of said third lever which one end coacts with the piston of
a third bore of said four bores, whereas the other end of said third lever coacts with the piston in the first bore of said four bores; the free end of the piston of the fourth bore being also pivotally connected to said second lever by means of
a pin-and-slot connection;
conduit means extending between adjoining bores in said housing and extending between the exterior of said housing and the first bore and the exterior of said housing and the third bore; said housing having
a conduit for communicating the interior thereof with said first chamber of said second cylinder.

4,648,307

UNLOADING VALVE FOR POWER STEERING PISTON WITH INTEGRAL GEAR

William T. Rabe, Lafayette, Ind., assignor to TRW, Inc., Lyndhurst, Ohio

Filed Oct. 10, 1985, Ser. No. 785,983
Int. Cl.[4] F15B *9/10, 15/22, 13/04*
U.S. Cl. 91—375 A **14 Claims**



6. A steering gear comprising:
a housing defining a chamber,
a piston dividing the chamber into first and second chamber portions, said piston being movable through a work stroke in opposite directions in said chamber,
steering valve means for directing fluid pressure into said first chamber portion and venting said second chamber portion to effect piston movement in a first direction and for directing fluid pressure into said second chamber portion and venting said first chamber portion to effect piston movement in a second direction,
an input shaft movable to effect actuation of said steering valve means, and
relief valve means for communicating said first and second chamber portions when said piston is near the end of its work stroke, said relief valve means comprising a valve member and valve seat which are movable relatively between a closed position blocking communication between said first and second chambers and a fully open position establishing communication between said first and second chambers when said piston reaches the end of its work stroke,
said valve seat having a press-fit connection with said piston which may be overcome by turning of said input shaft to adjust the position of said valve seat relative to said piston.

4,648,308

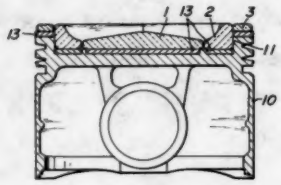
INTERNAL COMBUSTION ENGINE PISTON AND A METHOD OF PRODUCING THE SAME

Minoru Matsui, Nagoya, and Nobuo Tsuno, Kasugai, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Mar. 5, 1985, Ser. No. 708,397
Claims priority, application Japan, Mar. 12, 1984, 59-46653
Int. Cl.[4] F02F *3/12*
U.S. Cl. 92—212 **11 Claims**

1. An internal combustion engine piston comprising a piston cap which includes a plurality of ceramic pieces, and a metal piston body, said metal piston body having a top portion, the piston cap being fixed to the top portion of the metal piston body, wherein the piston cap comprises at least one ceramic material, and said plurality of ceramic pieces comprising the ceramic cap are bonded to the metal piston body through a metallized layer coated upon said plurality of ceramic pieces and a metal-plated layer coated upon the metallized layer such

that a bonding area created between said plurality of ceramic pieces and the metal piston body is greater at a central portion



on top of the piston body than a bonding area between said plurality of ceramic pieces and the metal piston body at any other portion.

4,648,309

LIGHT ALLOY PISTON

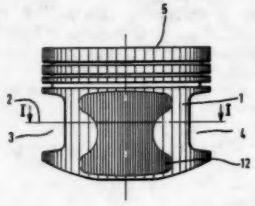
Klaus Schellmann, Weinsberg, Fed. Rep. of Germany, assignor to Kolbenschmidt AG, Neckarsulm, Fed. Rep. of Germany

Filed May 13, 1985, Ser. No. 733,552

Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418454

Int. Cl.⁴ F16J *1/04*

U.S. Cl. 92—233 **1 Claim**



1. In a light alloy piston for internal combustion engines, wherein the piston has bosses for a piston pin having a pin axis and a convex external shape from top to bottom and an oval external shape therearound and comprises a skirt which in the cold state has a larger running clearance at its top end than at its bottom end, the improvement wherein: the ovalness of the piston has a minor axis parallel to the pin axis and a major axis perpendicular thereto, the ovalness of the piston skirt is larger in the region adjacent to the horizontal plane containing the pin axis than in the remaining regions of the piston skirt and the ovalnesses merge continuously into each other.

4,648,310

SMOKE VENTILATION APPARATUS AND METHOD

Jimmie E. Wescoat, 1632 S. Green, Wichita, Kans. 67211, and William M. George, 1137 Burrus, Wichita, Kans. 67230

Filed Feb. 24, 1986, Ser. No. 831,838

Int. Cl.⁴ E05F *15/20*

U.S. Cl. 98—1 **11 Claims**

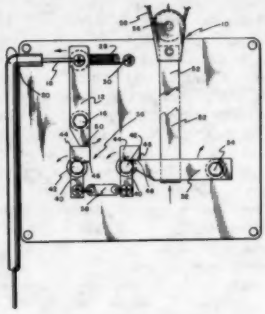
1. An apparatus for controlling smoke, or the like, in the event of a fire, or the like, comprising

a manual release arm means pivotally secured to a base surface means;

a spring bias means having one end attached to the base surface means and another end connected to the manual release arm means;

a releasing arm means pivotally connected to the base surface means;

a fire linkage means pivotally secured to the base surface means and releasably engaged to the releasing arm means and to the manual release arm means; and



a bar means under tension releasably engaging to said releasing arm means such that when the releasing arm means pivots and releases said bar means, the bar means travels away from said releasing arm means due to the tension.

4,648,311

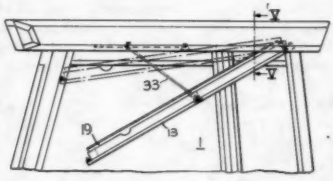
DOWNWARDLY SWINGING REPLACEABLE AIR FILTER FOR A VEHICLE CAB

Michael L. Slosiarek, Rome, Ga., and Robert J. Wagner, Milwaukee, Wis., assignors to Deutz-Allis Corporation, Milwaukee, Wis.

Continuation of Ser. No. 214,271, Dec. 8, 1980, abandoned. This application Nov. 22, 1982, Ser. No. 443,749

Int. Cl.⁴ B60H *3/06*

U.S. Cl. 98—2.11 **10 Claims**



1. A vehicle cab having filtering means comprising, a side wall on the side of said cab, a lateral roof overhang extending beyond said side wall and defining a filter chamber, means defining an air inlet passage and an air outlet passage from said filter chamber with passage means extending to an air ventilating system, a filter tray, a filter element in said tray, means providing a seal with said filter element at the inlet passage and the outlet passage of said filter chamber when said filter tray is in the operating position, means defining a filter servicing opening externally of said cab in said roof overhang for pivoting said tray through said servicing opening, pivotal support means pivotally supporting one end of said filter tray, a latch releasably holding the other end of said filter tray in the operating position and for releasing said tray for servicing of said filter element from the outside of said cab.

4,648,312

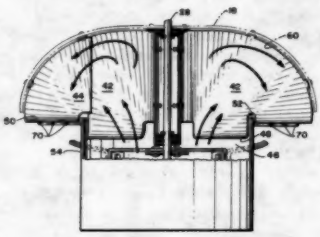
APPARATUS FOR VENTILATING AN ENCLOSED AREA

Louis A. Schad, 19643 Friar, Reseda, Calif. 91335

Continuation-in-part of Ser. No. 544,569, Oct. 24, 1983, abandoned. This application May 20, 1985, Ser. No. 736,229

Int. Cl.[4] F23L 17/10

U.S. Cl. 98—75 9 Claims



1. Apparatus for attachment to a vent tube for ventilating an enclosed area comprising;

a tube adaptor for mounting said ventilation apparatus on said vent tube;

rotatable hub means secured to and coaxial with said tube adaptor;

a substantially hemispherical domelike member rotatably secured to said hub means above said tube adaptor;

internal exhaust fan blade means rotatably mounted on the internal surface of said substantially hemispherical domelike member for rotation therewith;

said internal exhaust fan blade means having a lower edge curved under away from the direction of rotation providing a leading edge air foil, and having a titled concave contour away from said leading edge and direction of rotation;

said internal exhaust fan blade means having an intake portion and an exhaust portion; said lower leading edge being at the intake portion; said exhaust portion having a lower edge curved under in a surface of revolution the radius of which is larger than the intake portion curved edge;

said exhaust portion lower curved edge being semi-conical in shape with the apex of the cone pointing inward and converging toward a slot in said fan blade means between said intake portion and said exhaust portion;

a plurality of fins mounted on an external surface of said substantially hemispherical domelike member for rotation therewith;

said fins constructed and arranged on said substantially hemispherical domelike member to intercept a wind and thereby rotatably drive said substantially hemispherical domelike member and said internal exhaust fan blade means;

whereby said internal exhaust fan blade means functions to exhaust air from said enclosed area while said substantially hemispherical domelike member provides protection from the entrance of undesirable weather elements to said enclosed area.

4,648,313

BEVERAGE BREWING APPARATUS FOR A VENDING MACHINE

Yoshikazu Kokubun, Shin; Kunitake Hatori, Maebashi, and Takeshi Kanezashi, Kiryu, all of Japan, assignors to Sanden Corporation, Gunma, Japan

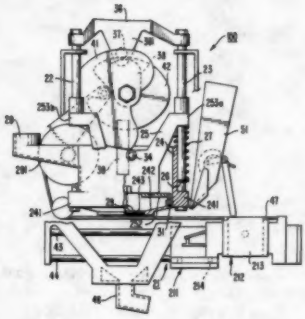
Filed May 24, 1985, Ser. No. 737,667

Claims priority, application Japan, May 28, 1984, 59-77018[U]

Int. Cl.[4] A47J 31/00

U.S. Cl. 99—289 R 2 Claims

1. In a beverage brewing apparatus comprising: a frame; a vertically movable cylinder member supported on said frame, said cylinder member having an open top and an open bottom; a vertically movable piston member disposed in said cylinder and supported by said frame; means for supplying hot water into said cylinder below the elevation of said piston; a base assembly including a brewing cavity disposed beneath said cylinder member, said brewing cavity being mounted to be movable horizontally between a brewing position and a discharge position and be sealed with said cylinder member in said brewing position; a motor driven camshaft; a plurality of cams on said camshaft; a first cam follower on said piston member; a second cam follower on said cylinder member; each of said cam followers being in contact with one of said cams



whereby movement of said piston member and said cylinder member is determined by operation of said cams through said cam followers; the improvement comprising mechanism provided on said piston member for preventing said piston member from undergoing lateral horizontal movement while said piston member moves downward to hold the center lines of said piston member and said cylinder member in alignment, said mechanism comprising a centering roller rotatably supported on said piston member together with said first cam follower and a guide element disposed on said frame facing said centering roller to guide rolling movement of said roller along a surface of said guide element.

4,648,314

WAFER BAKING AUTOMATIC MACHINE

Hans-Jurgen Plicht, Langen, and Heinrich Runkel, Erzhausen, both of Fed. Rep. of Germany, assignors to Hebenstreit GmbH, Moerfelden-Walldorf, Fed. Rep. of Germany

Filed May 31, 1984, Ser. No. 616,430

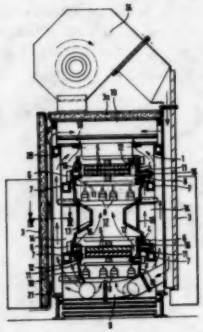
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1983, 3319886; Dec. 24, 1983, 3346970

Int. Cl.[4] A47J 37/01

U.S. Cl. 99—373 12 Claims

1. A wafer baking automatic machine, comprising a housing including housing side walls and a housing cover together bounding a baking chamber; an endless rotatable chain of baking clamps each having two baking plates and side parts, said chain being movable in said baking chamber and having a lower chain portion and an upper chain portion, said side parts of said baking clamps of said lower chain portion having upper edges, said side parts of said baking clamps of said upper chain portion having lower edges; guiding means for said chain and including guiding rails and guiding rollers movable on said guiding rails; heating means including heating burners for heating said baking plates; air supply means provided in a lower region of said baking chamber; air discharge means provided in said housing cover; a separating wall provided in said baking chamber and extending from said upper edges of said side parts of said baking clamps of said lower chain portion to said lower edges of said side part of said baking clamps of said upper chain portion so as to subdivide said baking cham-

ber into an inwardly located heating zone including said baking burners and said baking plates and an outwardly located flushing zone including said guiding rollers of said baking clamps and said guiding rails so that said guiding rollers are separated from said heating zone, said air supply means being open into said heating zone and into said flushing zone; air passages provided between said baking plates and said side parts of said baking clamps for passing hot air into said heating



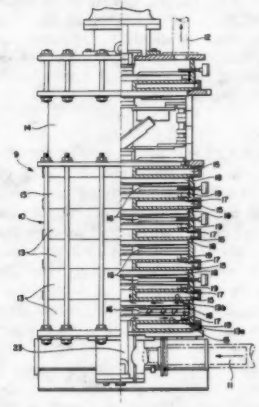
zone around said baking plates and inside said side parts, but not outside said side parts so that hot air does not pass in said flushing zone in the region of said guiding rollers; said side parts of said baking clamps of said lower chain portion having lower edges, and said separating wall having a lower wall portion extending from said heating burners to said lower edges of said side parts of said baking clamps of said lower chain portion.

4,648,315

DEVICE FOR TEMPERING CHOCOLATE MASSES AND THE LIKE

Günter Blum, Quickborn, Fed. Rep. of Germany, assignor to Blum & Co., Maschinen- und Apparatebau GmbH, Kaltenkirchen, Fed. Rep. of Germany

Filed Nov. 19, 1985, Ser. No. 799,488
Int. Cl.[4] A23C *3/04*; F25C *1/14*
U.S. Cl. 99—455 **4 Claims**



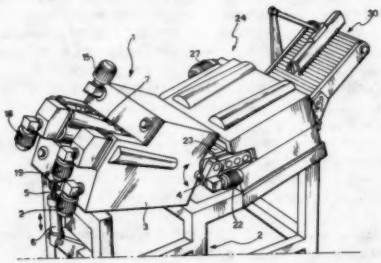
1. A device for tempering chocolate masses and the like comprising a casing having upper and lower ends, having an inlet adjacent the lower end thereof and an outlet adjacent the upper end thereof, and a sequential series of cooling sections in said casing, each of said cooling sections comprising a pair of cooled upper and lower cooling surfaces which cooperate to define a cooling chamber therebetween and a pair of rotating concentric upper and lower working elements in the respective cooling chamber thereof, each of said working elements comprising a central hub, a disc portion which extends outwardly from the central hub thereof and a plurality of helical scraping elements on one side of the disc portion thereof, the upper and lower working elements of each cooling section being positioned so that the scraping elements thereof intimately engage the adjacent upper and lower cooling surfaces, respectively, thereof and being constructed so that chocolate enters each of said chambers adjacent the hub of the lower working element thereof, is moved outwardly between the lower working element and the lower cooling surface thereof by the scraping elements on the lower working element thereof, and is then drawn inwardly between the upper working element and the upper cooling surface thereof toward the hub of the upper working element by the scraping elements on the upper working element thereof.

4,648,316

MACHINE FOR PREPARING A SEMI-FINISHED CONFECTIONERY PRODUCT

Giovanni Ruffinatti, Giaveno, Italy, assignor to Ruffinatti S.r.l., Bruino, Italy

Filed Apr. 2, 1985, Ser. No. 719,389
Claims priority, application Italy, Apr. 2, 1984, 67324 A/84
Int. Cl.[4] A23P *1/00*
U.S. Cl. 99—483 **13 Claims**

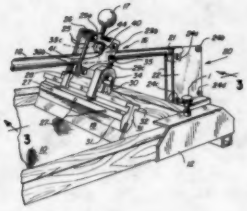


1. A machine for preparing a semi-finished confectionery product comprising a sweet outer layer within which thin sweet layers alternate with randomly oriented thin layers of a filling, from a strand comprising a sweet outer part which is in a palstic state but can crystallize on cooling, and which surrounds a core constituted by a filling; the machine comprising an extruder substantially in the form of a hopper, with a loading aperture for the introduction and accumulation of the strand and a drawing aperture towards which the accumulated strand descends under gravity to form a heterogeneous mass with a sweet plastic surface layer; said extruder having inner walls comprising surfaces which are moveable so as to exert on the sweet surface layer of this mass a massaging action which tends to impart to this surface layer a flowing movement substantially around the direction of advance of the mass and drive means for effecting the movement of these surfaces.

4,648,317
MANUALLY OPERATED SCREEN PRINTING APPARATUS

Henry J. Bubley, Deerfield, and Alex Iaccino, Mount Prospect, both of Ill., assignors to American Screen Printing Equipment Co., Chicago, Ill.

Filed May 7, 1985, Ser. No. 731,856
Int. Cl.[4] B05C *17/10*; B41L *13/02*
U.S. Cl. 101—123 **15 Claims**



7. A manually operated screen printing mechanism comprising,

a printing screen having a centerline therethrough,

a lever pivotally mounted at one end over the centerline of the screen and having a free end to be lifted relative to the screen,

a squeegee carriage mounted on the lever for reciprocating rectilinear movement and carrying a squeegee to engage the screen with substantially equal pressure on opposite sides of the lever,

a three point bearing means on said carriage mounting the carriage to slide along the lever at opposite angles of inclination to the vertical during the print and flood strokes,

a handle mounted on the squeegee carriage for grasping by the operator to push and to pull the squeegee carriage and to flip the carriage between the print stroke inclination and flood stroke inclination,

said handle including a ball mounted on top of the carriage for grasping with one hand, said lever being an elongated rod, an outer surface on the rod serving as a track for sliding engagement with the bearings,

said three point bearing means comprising a first bearing for engaging a first side of the rod in both the flood and print strokes and second and third bearings located to engage the opposite side of the rod, said first, second and third bearings being arranged in a triangular array, said second bearing engaging the rod in the flood stroke and the third bearing engaging the rod in the print stroke.

4,648,318
RUBBER BLANKET ATTACHMENT ARRANGEMENT FOR AN OFFSET ROTARY PRINTING MACHINE

Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

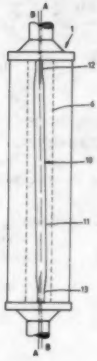
Filed Sep. 26, 1985, Ser. No. 780,394
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1984, 3437309
Int. Cl.[4] B41F *21/00, 27/00*; B24B *75/00*
U.S. Cl. 101—415.1 **6 Claims**

1. In combination with a printing machine, a rubber blanket (14) and a rubber blanket cylinder (1,2), for transferring print images, under pressure, onto a printing medium, formed with an, approximately axially, extending groove (6,7) for receiving and clamping end edges (25,26) of said rubber blanket (14) therein,

an attachment arrangement for the rubber blanket (14), the rubber blanket being formed with a reinforcing strip (15,16) at both first and second end edges of the rubber blanket, and

said groove (6,7) having a slot (10), a central zone (11) and two end zones (12,13) disposed at respective ends of said blanket cylinder, said groove being narrower in said end zones than in said central zone, whereby the effective width of said groove, when said blanket is clamped therein, is reduced, thereby minimizing both oscillation of said cylinder toward the printing medium when said groove is against said printing medium, and the linear portion of said printing medium which must be left free of print images, due to pressure reduction caused by said groove,

said reinforcement strip (15) along at least one of the end edges (25) of said rubber blanket (14) being shorter than



the distance between lateral edges (17,18) of the rubber blanket (14);

the rubber blanket (14) being formed with flared portions (19, 20) joining the lateral edges of said rubber blanket to the end edges, said flared portions starting from the full width of the rubber blanket at approximately the position where the blanket meets the circumference of the cylinder, said flared portions extending towards the shorter reinforcement strip, and

said end zones (12,13) of said groove receiving the flared portions of the rubber blanket, free from the reinforcement strip, and the central zone (11) having a width and an axial length just sufficient to permit passage of the shorter reinforcement strip (15) radially therethrough, for insertion of the reinforcement strip through the slot into the rubber blanket cylinder.

4,648,319
IGNITION DEVICE

Börje Westerlund, Kristinehamn, and Arne Vestring, Karlskoga, both of Sweden, assignors to Aktiebolaget Bofors, Sweden

Filed May 14, 1985, Ser. No. 733,831
Claims priority, application Sweden, May 14, 1984, 8402572
Int. Cl.[4] F42C *11/00*; F42B *3/02*
U.S. Cl. 102—202.12 **11 Claims**

1. An ignition device comprising:

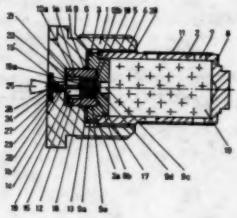
a said lower housing housing (1) provided with a recess (1*a*);

a sleeve (2) which is secured to said lower housing (1) and which contains a main ignition charge (10), and a sealing part (9) which faces said lower housing (1); and

an electric igniter (15) said electric igniter (15) comprising an insulating body (19) having an end surface (19*a*), an electric pole device (20), and an electric igniter housing (21), and at least one electrically connecting element located on said end surface (19*a*) of said insulating body (19) and interconnecting the electric pole device (20) and the electric igniter housing (21), said end surface (19*a*) and said

electrically connecting element contacting one of pyrotechnical charges (16,17) included in the ignition chain for a main ignition charge (10);

wherein said electric igniter (15) and pyrotechnical charges (16,17) are located inside a ring-shaped device (12), said ring-shaped device (12) having a first end from which said electric pole device protrudes, said ring-shaped device



(12) extending at least partly into said recess (1*a*) in the said lower housing (1), and wherein said sealing part (9) presses said pyrotechnical charges (16,17) against said end surface (19*a*) and the electrically connecting element of the electric igniter through a filler layer (18) in said ring-shaped device (12), and wherein said electric igniter (15) is secured to said ring-shaped device (12) and said ring-shaped device (12) is secured to said lower housing (1).

4,648,320

DETONATOR TRIGGERING DEVICE

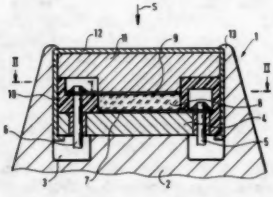
Wilhelm Fürst, Buchberg; Werner Rüdenauer, Roth, and Rainer Siebert, Rothenbach, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Mar. 26, 1985, Ser. No. 715,901

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1984, 3414841

Int. Cl.[4] **F42C** *11/02, 19/04;* **F42B** *19/34*

U.S. Cl. 102—210 **4 Claims**



1. In a detonator triggering device which is located in the head of an underwater projectile, said projectile having an opening in the head; and a pressure receiver positioned within the opening so as to be exposed to a dynamic pressure; the improvement comprising: a piezo-ceramic disc including electrical contacts being rigidly supported on one side thereof within said projectile head; a pressure transmitting member arranged within the opening in the head contacting the opposite side of the piezo-ceramic disc; a plate supporting the piezo-ceramic disc on the side of the disc opposite the pressure transmitting member, said plate including contact pins proximate the piezo-ceramic disc which are connected with the contacts; and a protective casing commonly encompassing the pressure transmitting member, the piezo-ceramic disc and the plate, said protective casing being retained within the projectile head.

4,648,321

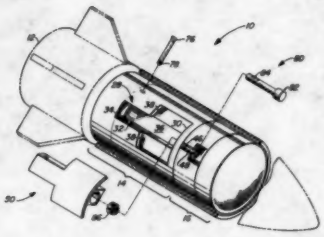
MISSILE SEPARATION SYSTEM

Kenneth P. Lusk, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 4, 1985, Ser. No. 720,204

Int. Cl.[4] **F42B** *13/32, 15/02*

U.S. Cl. 102—293 **8 Claims**



1. A missile adapted for controllable sectional separation in a flight path comprising:

a rocket motor section;

a canister section rigidly attached to said rocket motor section and defining a central cavity open on one end;

a payload section detachably attached to said canister section and closing said open end of said central cavity;

said payload section defining at least two peripheral recesses abutting said canister sections and peripherally spaced from each other, and at least two recess channels communicating with said canister section and said payload section recesses;

said canister section defining at least two longitudinally aligned generally rectangular primary peripheral recesses peripherally spaced from each other and in alignment with said peripheral recesses on said payload section, said canister section also defining two longitudinally aligned peripheral secondary recesses aligned in parallel relationship with said primary recesses and in communication therewith, said canister section further defining bores communicating between each canister section primary peripheral recess and the corresponding payload section peripheral recess;

a minimum of two explosive bolts each passing between corresponding peripheral recesses through said bore for detachably retaining said canister section to said payload section;

means for functioning said explosive bolts in response to a signal for effecting separation of said payload section from said canister section;

retarding means pivotally retained within each of said canister section peripheral recesses and interacting with said explosive bolts for deploying said retarding means and retarding flight of said canister after functioning of said explosive bolts;

resilient means for urging deployment of said retarding means disposed between said retarding means and said canister section peripheral recess; and

a parachute disposed within said central cavity of said canister section and attached to said payload section.

4,648,322

PROPULSION AND DIRECTIONAL CONTROL MECHANISM FOR AN UNDERWATER DEVICE

Steven A. Heitz, and Daniel R. Dobbs, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

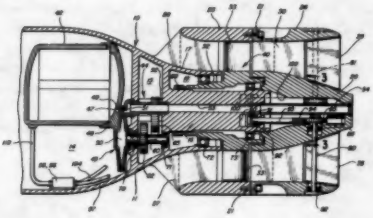
Filed Jul. 2, 1985, Ser. No. 751,507

Int. Cl.[4] **F42B** *19/01, 19/18*

U.S. Cl. 102—411 **22 Claims**

1. A mobile underwater device comprising, directional con-

trol means including a pair of movable fins at the aft end of the device, a pair of rotatable shafts extending transversely of said device and each mounting one of said fins, and means for positioning said fins by rotation of said shafts including a pair



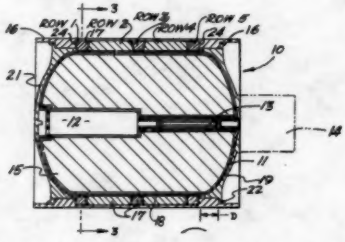
of fluid cylinders associated one with each of the rotatable shafts and each having a piston and a linearly movable piston rod, and a gear connection between each piston rod and associated rotatable shaft for converting linear movement of the piston rod into movement of a fin.

4,648,323

FRAGMENTATION MUNITION

Robert J. Lawther, Orange, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Mar. 6, 1980, Ser. No. 129,698
Int. Cl.⁴ F42B *13/18*
U.S. Cl. 102—495 **11 Claims**



1. A fragmentation munition comprising a central body of explosive material, and a fragmenting assembly surrounding said central body, said assembly including a plurality of preformed fragments of substantial tapered shape with the wider end on the outside of said assembly, and other fragments of tapered shape with the wider end on the inside of said assembly and having surfaces mating with the tapered sides of said preformed fragments, and one type of said preformed fragments being of higher density than said other fragments, said mating surfaces of said fragments with the wider end on the inside of said assembly having an outward pushing force on said preformed fragments when exploded.

4,648,324

PROJECTILE WITH ENHANCED TARGET PENETRATING POWER

Brian K. McDermott, Marion, Ill., assignor to Olin Corporation, Stamford, Conn.

Filed Oct. 1, 1985, Ser. No. 782,645
Int. Cl.⁴ F42B *11/06*
U.S. Cl. 102—518 **16 Claims**

1. A projectile with enhanced power for penetrating a target, comprising:

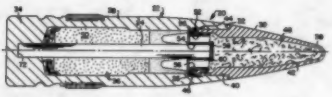
(a) an elongated casing having a main body with a hollow cavity defined therein and a nose with a hollow bore defined therein, said nose being interfitted with said main body and merged at its bore with said cavity of said main body;

(b) an elongated rod-like penetrator extending longitudinally within said casing and through said cavity in said main body thereof and into said bore of said nose thereof;

(c) a first destructive charge disposed in said nose bore;

(d) a second destructive charge disposed in said main body cavity; and

(e) means disposed within said casing so as to generally separate said nose bore and said main body cavity and retain said first charge in said nose bore, said means receiving and aligning said penetrator for forward penetrating travel upon impact of said nose with the target and also containing at least one passageway which provides communication of said nose bore with said main body cavity for allowing travel of ignition of said first charge from said nose bore to said second charge in said main body cavity and detonation of said second charge in said main body cavity after impact of said nose with the target, said means receiving and aligning said penetrator also being coupled to said penetrator and disposed with respect to said second charge such that said means absorbs the energy of said second charge and provides the necessary thrust for acceleration of said penetrator to a higher velocity upon detonation of said second charge.



4,648,325

LINEAR DRIVE UNIT

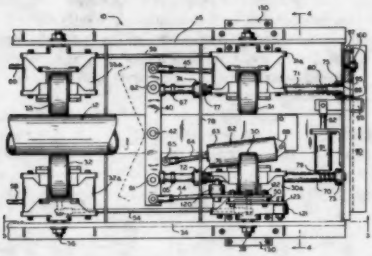
Stanley K. Gutekunst, Nazareth; Russell H. Scheel, Easton, and Barry L. Ziegenfus, Saylorsburg, all of Pa., assignors to Heico Inc., Mendota, Ill.

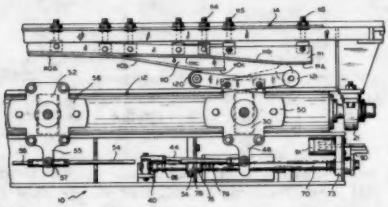
Filed Jun. 20, 1985, Ser. No. 747,054
Int. Cl.⁴ B61B *13/12*; B61L *3/04*
U.S. Cl. 104—166 **23 Claims**

1. A bi-directional linear drive unit having an elongate rotatable drive tube, a carriage movable lengthwise of said tube, a plurality of drive wheels on said carriage engageable with said drive tube arranged whereby rotation imparted to the drive wheels by the drive tube may impart linear movement to the carriage, means mounted said drive wheels for movement to positions either side of a neutral position wherein said drive wheels lie in a plane normal to the length of the drive tube, remotely-operable means including an air-operated motor on said carriage for moving said drive wheels to any one of said positions, yieldable means for urging said drive wheels from a position either side of the neutral position to said neutral position, and cam means operable to move said drive wheels from one of said positions toward said neutral position against the force of said motor.

23. A linear drive unit having an elongate rotatable drive tube, a carriage movable lengthwise of said tube, a plurality of drive wheels on said carriage engageable with said drive tube arranged whereby rotation imparted to the drive wheels by the drive tube may impart linear movement to the carriage, means mounting said drive wheels for movement to positions either side of a neutral position wherein said drive wheels lie in a plane normal to the length of the drive tube, remotely-operable means including a motor on said carriage for moving said drive wheels to any one of said positions, link means interconnecting said drive wheels for simultaneous movement and including a pivotable member, said motor having a movable member connected to said pivotable member, and selectively operable means for limiting the pivotal movement of said pivotable

member to establish an inching position for said drive wheels, comprising a spring-loaded movable rod engaging said pivotable member, a movable plate movable transversely to the path





of movement of the movable rod and positionable to obstruct the movement of the movable rod, and remotely-operable means for moving said plate.

4,648,326

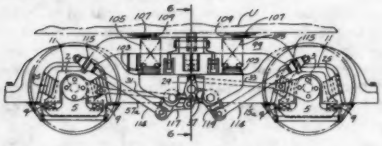
RADIAL AXLE RAILWAY TRUCK WITH AXLE COUPLINGS AT SIDES TRANSVERSELY INTERCONNECTED WITH EACH OTHER

Keith L. Jackson, Creve Coeur, Mo., assignor to Lukens General Industries, Inc., Coatesville, Pa.

Continuation-in-part of Ser. No. 704,563, Feb. 22, 1985, abandoned. This application Jun. 24, 1985, Ser. No. 748,406

Int. Cl.[4] B61F *5/30*

U.S. Cl. 105—168 **17 Claims**



1. In a railway vehicle truck, a pair of axles spaced apart longitudinally of the truck and each mounting a pair of transversely spaced flanged wheels having profiled generally frusto-conical treads, journal bearings mounted on the ends of said axles, a rigid truck frame having longitudinally extending side members resiliently supported on said journal bearings, longitudinally extending beams supported from and substantially fixed vertically with respect to said journal bearings at the respective sides of the truck, a transversely extending shaft journaled in said beams intermediate said axles, and thereby maintaining said shaft at a substantially constant height from the rails irrespective of vertical movements of the truck frame relative to the journal bearings, separate Z-linkages at each side of the truck comprising generally upright levers fixed to the ends of said shaft outboard of the sides of said truck frame and a pair of links at each side of the truck, one link of each pair being pivotally secured at one end to the upper end of the respective lever and the other link of each pair being pivotally secured at one end to the lower end of the respective lever, the ends of all said links remote from the ends secured to said levers being pivotally connected respectively to said journal bearings at the respective sides of the truck, the links at the opposite sides of the truck connected to the upper end of the respective levers being connected at their oposite ends to each of one pair of diagonally opposite journal bearings, and the links at the opposite sides of the truck connected to the lower ends of the respective levers being connected at their opposite ends to each of the other pair of diagonally opposite journal bearings, whereby to couple wheel induced yawing movements of the axles in opposite senses to permit radial positioning of the axles on curved track and to oppose hunting movements of the axles.

4,648,327

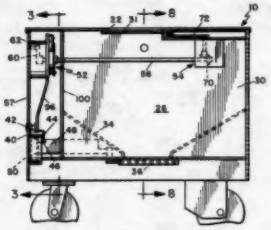
SAFE LOCKING MECHANISM

John E. Toth, Cottonwood, Ariz., and Ronald L. Hempfling, Poway, Calif., assignors to Cubic Western Data, San Diego, Calif.

Filed Jul. 1, 1985, Ser. No. 750,930

Int. Cl.[4] E05G *1/00*

U.S. Cl. 109—57 **11 Claims**



1. A mobile safe for locking within an outer container such as a vault, the safe comprising:

a housing having at least one upper loading door for receiving cash and at least one lower unloading door for removing cash from the safe;

an upper loading door actuating means for moving the upper door between an open and closed position;

an internally mounted upper loading door locking mechanism associated with said upper loading door actuating means for automatically locking the upper loading door in its closed position when said actuating means moves said upper door into said closed position;

a lower unloading door locking mechanism for locking the lower unloading door closed;

the upper loading door actuating means including external means for engagement with a vault door locking mechanism when the safe is placed in a vault and the vault door is closed, said external means comprising means for rotation into a first position in which the upper loading door is open when said vault door is locked, and for rotation into a second position in which said upper loading door is closed when said vault door is locked; and

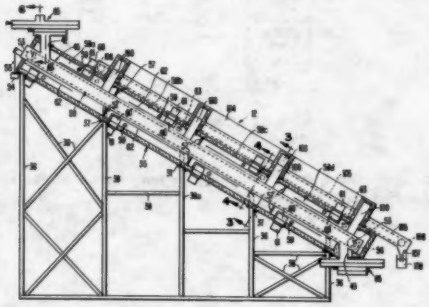
linkage means for linking said lower unloading door locking mechanism to said upper loading door locking mechanism, said linkage means comprising means for releasing said locking mechanism to allow said upper loading door to be opened when said lower unloading door is unlocked.

4,648,328

APPARATUS AND PROCESS FOR THE PYROLYSIS OF TIRES

William R. Keough, 1854 Hunters Ridge Dr., Bloomfield Hills, Mich. 48103

Filed Sep. 30, 1985, Ser. No. 781,520
Int. Cl.[4] F23G 5/12
U.S. Cl. 110—229 **10 Claims**



1. A reactor for the pyrolysis of fragmented used tires comprising

(1) an inner, completely sealed reactor liner;

(2) an outer insulated housing perimetrically enclosing the inner liner and spaced perimetrically therefrom;

(3) means interposed between the liner and the housing to divide the space therebetween into thermally isolated longitudinally adjacent zones traversed by the inner liner;

(4) a single chain and flight conveyor enclosed in the inner liner for conveying tire fragments therethrough, the conveyor flights travelling in close proximity to the interior surfaces of said liner to prevent the accumulation of reaction products thereon;

(5) air lock means for the ingress of reaction ingredients into and the egress of solid reaction products from the inner liner;

(6) outlets for the egress of gaseous reaction products from the inner liner; and

(7) separate combustion heating means positioned in each of said longitudinally adjacent zones and interposed between the outer housing and the inner liner for differentially heating the inner liner in successive zones solely by conduction through the inner housing.

4,648,329

DEVICE FOR REINJECTING FLOWN-OFF PARTICLES INTO A SOLID FUEL BOILER

Michel F. E. Couarc'h, Vernouillet; Roger Beasouat, Paris; Marc R. R. Lafaye, and Robert R. E. Bernet, both of Amiens, all of France, assignors to Manutair Moller, Amiens and Stein Industrie, both of, France

PCT No. PCT/FR84/00256, § 371 Date Jul. 3, 1985, § 102(e) Date Jul. 3, 1985, PCT Pub. No. WO85/02246, PCT Pub. Date May 23, 1985
PCT Filed Nov. 9, 1984, Ser. No. 752,309
Claims priority, application France, Nov. 9, 1983, 83 17811; Feb. 6, 1984, 84 01774
Int. Cl.[4] F23G 5/00
U.S. Cl. 110—245 **18 Claims**

1. A device for reinjection of flown-off particles into a solid fuel boiler, fed with fuel by means (10) arranged in a first zone (9) of the boiler fire box and which projects continuously a determined load of fuel on a trajectory (20) leading the latter into a second zone (21) of the boiler, onto a grid (3) driven with a return movement (8) from the second zone (21) towards the first (9), combustion occurring long the said trajectory (20) and on the grid (3) permitting release (26) of flue gases entraining solid particles, this device comprising:

means (27) for drawing off the flue gases in the boiler,

means (44) for evacuation of the flue gases,

first separation means (36), for the separation of relatively large particles,

second separation means (43), for the separation of relatively fine particles,

means (28) for leading the flue gases from the drawing off means (27) to the first separation means (36), from the first separation means (36) to the second separation means (43), from the second separation means (43) to the evacuation means (44) of the flue gases,

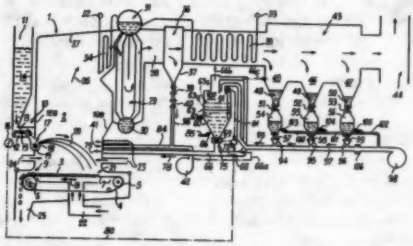
means (37,38,39,40,41,42,84) for drawing off particles in the first separation means (36) and of reinjecting such particles into the boiler,

means for drawing off the particles in the second separation means (43),

this device being characterised in that the means for drawing off particles in the second separation means (43) comprise:

(a) a buffer storage (60,160,161,162,260,261,262,360,361,362),

(b) means (51 to 59) for discharging particles from the second separation means (43) into the buffer storage (60,160,



161,162,260,261,262,360,361,362), preventing direct communication between these latter,

(c) means (69,169,170,269,270,369,370,371) for continuous drawing off of particles at the lower part of the buffer storage (60,160,161,162,260,261,262,360,361,362) with an adjustable flow rate,

(d) means (80,81,380,381,382,383,391,392,393) for controlling to the load of the boiler the flow rate of the means (69,169,170,269,270,369,370,371) for continuous drawing off of particles in the buffer storage (60,160, 161,162,260,261,262,360,361,362),

and in that there is provided:

a source (98,107,42,167,267,367) of air under pressure,

injection means (79,179,279,379) arranged in the proximity of the second zone (21) of the boiler and opening towards a part of the said trajectory (20) close to the grid (3) in this second zone (21),

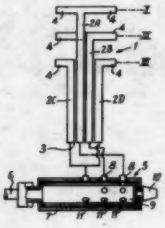
a pneumatically conveying duct (66,166,266,366) for connecting the source of air under pressure (98,107,42,167,267,367) to the injection means (79,179,279,379), the means (69,169, 170,269,270,369,370,371) for continuous drawing off of particles in the buffer storage (60,160,161,162,260,261,262,360,361,362) opening into the said duct (66,166,266,366).

4,648,330

APPARATUS FOR INJECTING FLUIDIZATION GAS

Arnaud Delebarre, Lille, France, assignor to Charbonnages de France, Paris, France

Filed Apr. 24, 1985, Ser. No. 726,463
Claims priority, application France, Apr. 25, 1984, 84 06490
Int. Cl.[4] F23C 11/02
U.S. Cl. 110—263 5 Claims



1. Apparatus for injecting starting-up fluidization gas between a lower level and an upper level of a bed of material held in an enclosure having a bottom, which apparatus comprises at least one conduit which can be connected at one end thereof to a fluidization gas delivery means and can extend in the enclosure between the bottom of the enclosure and an upper fluidization level, a plurality of nozzles which are provided on the at least one conduit such that the or each conduit has at least one nozzle for blowing fluidization gas into the enclosure from the respective conduit the nozzles being disposed in several planes which are spaced in a direction along the length of the at least one conduit so that the nozzles can be spaced between the upper fluidization level and the bottom of the enclosure, and means for selectively communicating in succession the nozzles which are in the successive spaced planes with the fluidization gas delivery means, such that the highest nozzle or nozzles can be communicated with the fluidization gas delivery means and then the lower nozzles successively, said at least one conduit consisting of a first outer conduit which is closed at one end thereof and a second conduit which is mounted inside the first conduit and spaced from the said closed end, one of the first and second conduits being provided with the said nozzles on a side wall thereof, the nozzles being spaced circumferentially and the said one conduit being closed at that end which is remote from the closed end of the first conduit, and said means for selectively communicating comprising a movable transverse shutter which is connected to an operating member and is mounted in the said conduit which has the nozzles, the conduit not having the nozzles being connected to the fluidization gas delivery means via that end thereof which is remote from the said closed end of the first conduit.

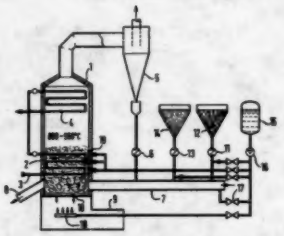
4,648,331

PROCESS FOR THE REDUCTION OF NO_x IN FLUIDIZED-BED FURNACES

Franz Thelen, Mülheim, Fed. Rep. of Germany, assignor to Steag AG, Essen, Fed. Rep. of Germany

Filed Mar. 4, 1985, Ser. No. 708,060
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1984, 3407689
Int. Cl.[4] F23B 7/00
U.S. Cl. 110—342 3 Claims

1. A process for the reduction of NO_x content in combustion waste gases, comprising introducing into the fluidized bed of a fluidized bed incineration, a reducing agent selected from the group consisting of NH_3 and a nitrogen-containing hydrocarbon compound, and maintaining the temperature of the fluidized bed about 800°–950° C.

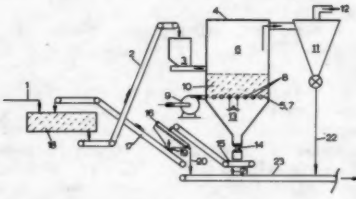


4,648,332

METHOD OF CLEANING CONTAMINATED SOIL

Cornelis Goedhart, Uithoorn, Netherlands, assignor to Esmil B.V., Amsterdam, Netherlands

Filed Mar. 25, 1986, Ser. No. 843,606
Claims priority, application Netherlands, Mar. 25, 1985, 8500860
Int. Cl.[4] F23G 5/00
U.S. Cl. 110—346 14 Claims



1. A method of cleaning contaminated soil comprising the steps of

(a) feeding the contaminated soil to a combustion space of a fluidized bed furnace having, at the underside of said combustion space, a structure for air distribution,

(b) forming a fluidized bed of the contaminated soil above said air distribution structure in the combustion space by means of combustion air delivered under elevated pressure via the air distribution structure, and

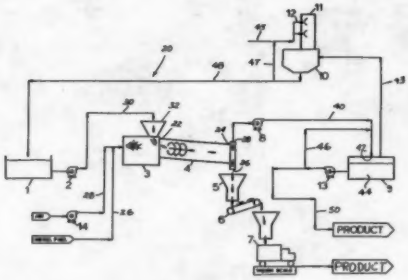
(c) mainly or completely burning the imourities from the soil in the combustion space, to provide cleaned soil, said air distribution structure comprising a generally horizontal grid of pipes having air distribution nozzles, the combustion air passing in the pipes to the nozzles, there being gaps between the pipes and a collection space beneath the air distribution structure in communication via said gaps with the combustion space, coarse soil particles passing through said gaps into the collection space from the combustion space, whereby in the method a coarse fraction of cleaned soil is discharged via the collection space and a fine fraction of cleaned soil is discharged upwardly from the combustion space with flue gas and is separated from the flue gas.

4,648,333

METHOD FOR TREATING OIL FIELD WASTES CONTAINING HYDROCARBONS

Robert E. Mudd, and Wendell L. Wyatt, both of Cameron, La., assignors to National Environmental Services, Inc., Houston, Tex.

Division of Ser. No. 517,113, Jul. 25, 1983, Pat. No. 4,575,336. This application Jul. 18, 1985, Ser. No. 752,835
Int. Cl.[4] F23G 7/04
U.S. Cl. 110—346 27 Claims



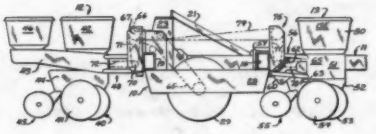
1. A method for recycling particulate matter from liquid waste containing carbonaceous materials comprising:
burning liquid waste to separate the liquid waste into dried waste and gaseous waste, the particulate matter being suspended in the gaseous waste;
removing the dried waste;
mixing the gaseous waste with a liquid to remove the particulate matter from the gaseous waste;
removing the gaseous waste from the liquid so the particulate matter suspended in the liquid may be reused; and
returning the particulate matter removed from the gaseous waste to the liquid waste for burning to separate the liquid waste into dried and gaseous waste.

4,648,334

AGRICULTURAL ROW CROP PLANTER WITH REAR-DRIVEN ROW UNITS

Jon E. Kinzenbaw, Williamsburg, Iowa, assignor to Kinze Manufacturing, Inc., Williamsburg, Iowa

Continuation of Ser. No. 534,541, Sep. 22, 1983, abandoned. This application May 20, 1985, Ser. No. 736,411
Int. Cl.[4] A01C 5/00; A01B 63/00
U.S. Cl. 111—52 4 Claims



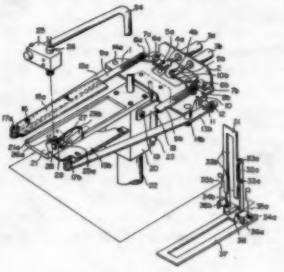
1. An agricultural row crop planter comprising main frame means adapted to be pulled by a tractor and including forward and rear transverse mounting bars connected together to form said main frame means, first and second sets of row units, each set including a plurality of individual row units, each row unit including a row unit frame adapted to be mounted to said mounting bar means, furrow opener means carried by said row unit frame, gauge wheel means mounted to said row unit frame immediately adjacent said furrow opener means, and furrow closing means carried by said row unit frame behind said gauge wheel means; a first plurality of four-bar parallel linkage means, one associated with each row unit of said first set and connected to the rear of its associated row unit frame, for individually mounting said row units of said first set to said forward mounting bar such that said row units of said first set extend substantially entirely in front of said forward mounting bar; a second plurality of four-bar parallel linkage means, one associated with each row unit of said second set and connected to the front of its associated row unit frame, for individually mounting said row units of said second set to said rear mounting bar and extending behind said rear planter bar to be pulled by said frame, said row units of said second set being mounted at equal lateral spacing and in alternate relation with said row units of said first set; whereby said row units of said first set are pushed by said main frame means through said first linkage means and said row units of said second set are pulled by said main frame means through said second linkage means when said main frame means is pulled by said tractor.

4,648,335

APPARATUS FOR SETTING A WORKPIECE CORRECTLY ON A SEWING MACHINE

Tooru Hiramatsu; Kazuya Tami, and Kozo Osawa, all of Chofu, Japan, assignors to Tokyo Juki Industrial Co., Ltd., Chofu, Japan

Filed Apr. 28, 1986, Ser. No. 856,692
Claims priority, application Japan, Apr. 27, 1985, 60-91720
Int. Cl.[4] D05B 3/12
U.S. Cl. 112—114 1 Claim



1. An apparatus for setting a workpiece on a sewing machine, comprising:
a casset table which is fixed to a table and sets a casset-set having upper and lower plates to clamp a workpiece,
an install-plate which is hinged to move up and down at said table by a horizontal shaft,
a pair of set-levers sustained horizontally and in parallel on said install-plate,
narrowing means for narrowing the ends of said set-levers to form a "V" shape,
moving means for moving said set-levers to reduce the angle of said "V" shape, and
driving means to activate said install-plate and said narrowing and moving means.

4,648,336

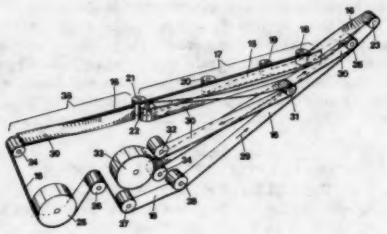
DEVICE FOR FOLDING AN EDGE OF A FABRIC FOR MAKING A HEM

Chris Ragnebring, Viskafors, Sweden, assignor to Akab of Sweden AB, Boras, Sweden

Filed Mar. 6, 1985, Ser. No. 708,843
Claims priority, application Sweden, Mar. 6, 1984, 8401218
Int. Cl.[4] D05B 35/02, 27/00; B31B 1/58
U.S. Cl. 112—147 4 Claims

1. A device for folding at least one edge of a fabric for making a single or a double hem, said device comprising: a feed table having a horizontally arranged top on which said fabric is intended to be placed substantially horizontally with a side edge to be folded hanging over a side edge of the feed table;

transport means for feeding the fabric along the feed table through said device; fold shaping means comprising portions of two endless bands of which at least one is twisted in correspondence with the gradual folding of the fabric edge during the feeding thereof through said device; said fold shaping means further comprising first and second fixed rules, said first rule having opposite flat sides being a substantially vertical extension of the horizontally arranged table top, the first end-



less band within the area for the first rule being arranged substantially in parallel with and in direct contact with a fabric edge placed between said first band and one flat side of the first rule, the second endless band at the front end portion of the first rule as seen in the feeding direction of the fabric being in cross section substantially horizontal, and located below the first rule and at the back end portion of the first rule being substantially vertical and located on the opposite flat side of the first rule as compared to the first band.

4,648,337

WORK EDGE GUIDING DEVICE FOR SEWING MACHINE

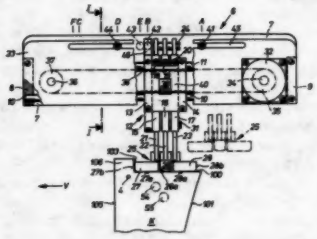
Günther Mall, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed May 20, 1986, Ser. No. 865,554

Claims priority, application Fed. Rep. of Germany, May 30, 1985, 3519344

Int. Cl.[4] D05B *35/10*

U.S. Cl. 112—153 **10 Claims**



1. An edge guiding device for guiding a workpiece to be sewn, the workpiece having edges extending at angles to each other and defining at least one inside corner, the workpiece being movable in a feed direction for having seams which are parallel to the edges formed on the workpiece, the edge guiding device comprising an edge ruler defining a guide face extending in a substantially vertical plane parallel to the workpiece feed direction, an actuator connected to said edge ruler for moving said edge ruler between an active and an inactive position, said edge ruler being formed by a central section and two outer sections disposed on opposite sides of said central section, said sections together defining said guide face with each section carrying a portion of said guide face, said edge ruler being movable synchronously with displacement of the workpiece in the feed direction during formation of seams beginning or ending at the inside corner of the workpiece, said actuator including separately controllable actuator portions connected to said central section and to said two outer sections for jointly and independently moving said central and two outer sections.

4,648,338

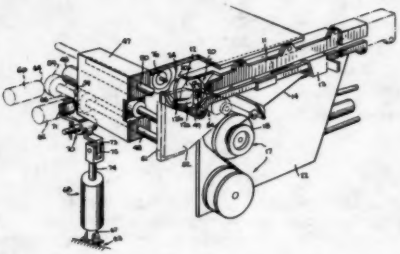
AUTOMATIC BOBBIN AND BOBBIN CARRIER CHANGING APPARATUS FOR SEWING MACHINE

John B. Russoni, Milpitas, and Ronald A. Cole, San Jose, both of Calif., assignors to Max Kahn Curtain Corporation, New York, N.Y.

Filed Jul. 8, 1985, Ser. No. 752,894

Int. Cl.[4] D05B *57/26, 19/00*

U.S. Cl. 112—180 **13 Claims**



1. An apparatus for changing bobbins and bobbin carriers in a sewing machine having a bobbin housing and a frame, comprising:

means, adapted to be coupled to said frame of said sewing machine, for supplying a queue of bobbin carriers containing bobbins to said sewing machine, including

means for guiding a lead bobbin carrier of said bobbin carriers into said bobbin housing;

means, adapted to be coupled to said frame, and coupled to said bobbin carrier supplying means, for linearly reciprocating said bobbin carrier supplying means between a first position wherein said guiding means is aligned with said bobbin housing and a second position wherein said bobbin carrier supplying means is clear of said bobbin housing; and

means, adapted to be coupled to said frame, for removing spent bobbins and corresponding bobbin carriers from said bobbin housing, and for positioning said bobbin carriers from said bobbin carrier supplying means in said bobbin housing.

4,648,339

SPEED CONTROL APPARATUS FOR SEWING MACHINE

Katsuhiro Fujikawa, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1985, Ser. No. 739,259

Claims priority, application Japan, May 30, 1984, 59-108485

Int. Cl.[4] D05B *69/18*

U.S. Cl. 112—277 **10 Claims**

1. A sewing machine speed control apparatus comprising:

a driving means for driving said sewing machine;

braking means for braking the rotating movement of said sewing machine;

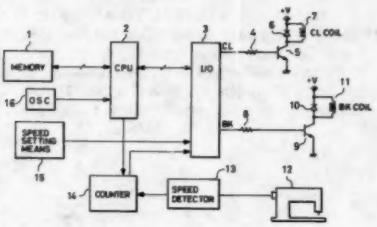
speed detecting means for detecting a rotating speed of said sewing machine and outputting a speed detection signal accordingly;

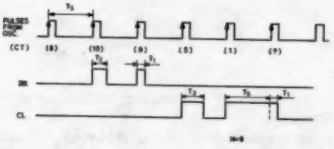
speed setting means for outputting a speed setting signal to set a rotational speed of said sewing machine; and

control circuit means, responsive to said speed detection

signal and said speed setting signal, for outputting a speed instructive pulse signal to said driving means and said braking means;

said control circuit means including oscillator means, having an oscillating period, for generating a pulse for determining a duration of one speed control period, and a counter for counting pulses corresponding to said speed detection signal in every said one speed control period determined by said oscillator means, means for calculating a difference between an actual speed detected by said speed detection means and a setting speed set by said speed setting means during said one speed control period, and means for changing the pulse width of said speed instructive pulse signal within said one speed control period in accordance with said difference, the pulse width of the speed instructive pulse signal being changed in accordance with a difference between the count of said counter and said setting speed.



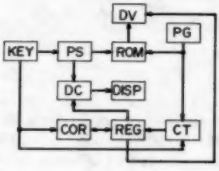


4,648,340

AUTOMATIC BUTTONHOLE STITCHING DEVICE OF A COMPUTERIZED SEWING MACHINE

Susumu Hanyu; Kenji Kata, both of Tokyo, and Yoshitaka Takahashi, Sagamihara, all of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1985, Ser. No. 727,903
Claims priority, application Japan, Apr. 26, 1984, 59-82957
Int. Cl.⁴ D05B *3/06*
U.S. Cl. 112—447 **6 Claims**



1. An automatic buttonhole stitching device for a computerized sewing machine having first memory means storing a plurality of pattern data for different patterns to be stitched including a buttonhole composed of first and second sections, the pattern data being selectively and sequentially read out with a timing pulse to control stitch forming instrumentalities of the sewing machine to produce a selected pattern of stitches, and the sewing machine being programmed to produce the selected pattern repeatedly, the automatic buttonhole stitching device comprising:

(a) pattern selecting means including ten-key switches **0–9** selectively operated to designate stitch control data for a selected pattern, said pattern selecting means further including at least first and second buttonhole switches (**B1, B2,**) a first buttonhole switch **B1** being operated to produce a first section of the buttonhole and a second buttonhole switch **B2** being operated to produce a second section of the buttonhole, each of said first and second sections including line-tack stitches RL, LL each formed with a fabric feeding amount of a predetermined parameter α;

(b) first display means including a first display **D1** responsive to a selective operation of said ten-key switches to display a selected pattern by way of a specific number;

(c) counter means CT operated in response to said timing pulse to count up said line-tack stitches of the buttonhole during formation of said buttonhole;

(d) second memory means REG for temporarily storing a value of said line-tack stitches counted up by said counter means:

(e) correction-control means COR for correcting the length of said once formed buttonhole, said correction control means including a data read-out switch **R** operated to read out said value stored in said second memory means REG to indicate said value in said first display **D1**, a plus-key switch **5** operated to lengthen the length of said buttonhole, a minus-key switch **6** operated to shorten the length of said buttonhole, and a second display **D2** responsive to the operation of one of said plus and minus-key switches **5, 6** and then to the selective operation of said ten-key switches to display a designated correction value; and

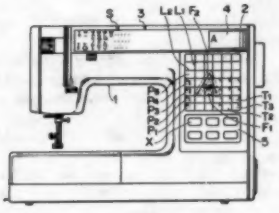
(f) an actuating switch **OK** operated to actuate said correction control means COR to make a calculation with said fabric feeding parameter α and said designated correction value under a predetermined formula, to thereby provide a calculated value of stitches to be needed for the length correction of said buttonhole, said calculated value being applied to the counted value stores in said second memory REG in one or the other way depending upon the selective operation of said plus and minus-key switches **5, 6** to provide a resultant final value for determining the number of said line-tack stitches of said buttonhole to be corrected, said final value being stored in said second memory means REG and indicated in said first display **D1**.

4,648,341

COMPUTERIZED SEWING MACHINE

Kenji Kato; Yoshio Yamaguchi, both of Tokyo, and Yoshitaka Takahashi, Sagamihara, all of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1985, Ser. No. 753,678
Claims priority, application Japan, Jul. 12, 1984, 59-143252
Int. Cl.⁴ D05B *3/02*
U.S. Cl. 112—458 **8 Claims**



1. A computerized sewing machine having a stitch forming device for changing relative positions between a needle and a

fabric to be sewn to form stitches in the fabric, a stitch pattern selecting device including an input panel provided with a plurality of switching keys for entering different characters assigned to predetermined stitching patterns, said selecting device comprising

a first memory (B7) storing a first group of data for a first group of stitch patterns;

a second memory (B4) storing a second group of data for a second group of stitch patterns;

input data detecting means (B1) cooperating with said input panel to generate data corresponding to actuated switching keys;

input data storing means for temporarily storing data generated by said input data detecting means;

comparing means (B5) for comparing data from said input data storing means with data stored in said second and first memories, and delivering pattern data for a pattern of said second group conforming with the input data;

indicating means (B6) for displaying the conforming pattern data from said second group;

search means connected to said first memory to read out therefrom pattern data for a pattern of said first group conforming with said input data, said search means delivering the read out data to said stitch forming device; and

selection mode changing means (B11) connected between said comparing means and said search means and being operable either in a direct selection mode in which said conforming pattern data from said second group is directly applied via said search means to said stitch forming device, or in an indirect selection mode in which the conforming pattern data is indirectly applied to said search means via a pattern data numbering means (B12).

4,648,342

ARRANGEMENT IN VESSELS

Geoff Collins, St. Catharines, Canada, and Kimmo Juurmaa, Vantaa, Finland, assignors to Oy Wartsila Ab, Helsinki, Finland

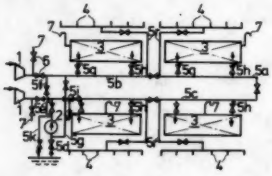
Continuation of Ser. No. 577,303, Feb. 6, 1984, Pat. No. 4,546,719, which is a continuation of Ser. No. 322,935, Nov. 19, 1981, abandoned. This application Oct. 11, 1985, Ser. No. 786,820

Claims priority, application Canada, Feb. 10, 1981, 370510

The portion of the term of this patent subsequent to Oct. 15, 2002, has been disclaimed.

Int. Cl.[4] B63B *1/38, 35/08*

U.S. Cl. 114—40 **24 Claims**



1. In a vessel having a hull with underwater openings, an air bubbling system for blowing out air through said underwater openings, a ballast system comprising a plurality of interconnected ballast tanks and means for feeding water into said tanks and means for expelling water from said tanks by means of pumping;

said ballast system being combined with said air bubbling system;

said combined ballast system and said air bubbling system being operatively associated and including a common tube system extending longitudinally in said vessel and being alternatively connectable to said ballast tanks for pumping water to or from one or several of said tanks and connectable to said air bubbling system for conducting air to said underwater openings, said tube system having a plurality of branches;

a valve system controlling said branches of said tube system, said valve system being a remote controlled system; and,

means for providing power to said remote controlled system, to said pumping water means and to means for producing compressed air for said air bubbling system.

4,648,343

BAND MAGAZINE WITH ANCHOR BAND

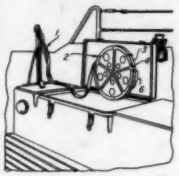
Hakan Hallberg, Tegelbruksvägen 186, S-46200 Vänersborg; Hans Österberg, Höjdvägen 11, 43080 Hovås, and Einar Olander, Smedsbacksoj. 9, 11539 Stockholm, all of Sweden

Filed Jan. 17, 1984, Ser. No. 571,650

Claims priority, application Sweden, Feb. 1, 1983, 8300513

Int. Cl.[4] B63B *21/22*

U.S. Cl. 114—210 **10 Claims**



1. An apparatus for conveniently attaching an anchor to a boat, comprising:

a strong flexible flat anchor band having a thickness considerably smaller than its width, for attachment at a first end to an anchor of said boat; and

band retaining means providing a fixed space only slightly wider than said anchor band, said fixed space being defined by two parallel end plates non-rotatably attached to said boat, for retaining a wound-up length of said anchor band therein, attached to a second end of said anchor band and attached to said boat.

4,648,344

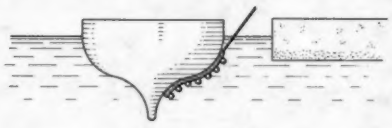
BOAT HULL CLEANING DEVICE

John Burgers, P.O. Box 2101, and Ronald P. Setzer, P.O. Box 5224, both of Santa Cruz, Calif. 95063

Continuation of Ser. No. 557,544, Dec. 2, 1983, abandoned. This application Jul. 5, 1985, Ser. No. 752,486

Int. Cl.[4] B63B *59/08*

U.S. Cl. 114—222 **9 Claims**



1. A one-man manually operable device for cleaning marine growth from submerged portions of a boat hull, comprising,

an elongated sheet of relatively thin material having a substantial length to width ratio, and having opposite surfaces thereon and opposite proximate and distal ends along the length thereof, wherein said strip is of a length to extend a substantial distance downwardly along the side of a boat hull from a point at the upper edge thereof,

one said sheet surface having scrubbing material affixed thereto over substantially the entirety thereof between said sheet ends,

the opposite said sheet surface having a plurality of discrete

floats affixed thereto at spaced points along the length thereof between the sheet ends,

handle means for manipulation and underwater extension of said sheet and said distal end thereof,

said handle means being a single elongated operator's handle affixed only to and extending from one proximate sheet end, with said distal end being free of any operating handle means thereon,

said sheet having sufficient rigidity in a direction along its length so as to permit ready manual manipulation by said single handle of said sheet in the water proximate to a boat hull to position the said distal sheet end at a furthermost distance of said sheet from said handle at a desired location with respect to said hull notwithstanding inherent forces on said sheet to fold and buckle the sheet by buoyancy of said floats as said sheet is manually inserted and immersed downwardly in water, and,

said sheet having sufficient flexibility to permit limited bending thereof in a direction parallel to the sheet width in response to buoyant float forces thereon when submerged, thereby to permit said sheet to substantially accommodate curvature of the boat hull,

whereby when said sheet is submerged into water adjacent a boat hull with said one sheet surface scrubbing material proximate the boat hull, said handle and said sheet rigidity permitting desired positioning of said sheet and distal sheet end for cleaning a hull area, and said floats effect limited flexing thereof under buoyant pressure so as to substantially conform said sheet along its length to curvature of said boat hull thereby to place said scrubbing material in contact with said hull, whereby manual manipulation of said handle to reciprocate said sheet in a direction along its length will effect cleaning of said hull.

4,648,345

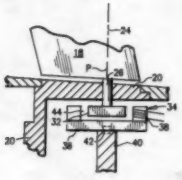
PROPELLER SYSTEM WITH ELECTRONICALLY CONTROLLED CYCLIC AND COLLECTIVE BLADE PITCH

John L. Wham, San Diego; Lawrence A. Mackey, Santee, both of Calif., and Frederick R. Haselton, Cookeville, Tenn., assignors to Ametek, Inc., El Cajon, Calif.

Filed Sep. 10, 1985, Ser. No. 774,565

Int. Cl.[4] B63G *8/16*

U.S. Cl. 114—338 **32 Claims**



1. A propeller system, comprising:

a plurality of blades;

hub means for supporting the blades for rotation about a common drive axis and so that each blade can be independently twisted about a corresponding blade axis to vary the pitch of the blade relative to the drive axis; and

means for rotating the hub means about the drive axis and for twisting the blades to non-sinusoidally vary a cyclic pitch and a collective pitch of the blades during rotation of the hub means, including a plurality of permanent magnets, each rigidly connected to a root of a corresponding blade.

4,648,346

PALLET FOR USE IN PRODUCTION OF COLOR CATHODE RAY TUBE

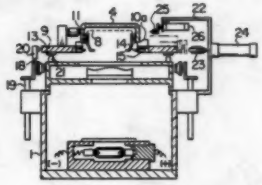
Hideo Miyazawa; Shokichi Endo, both of Mobara, and Hideo Nishimoto, Yachiyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 555,614, Nov. 28, 1983, abandoned. This application Mar. 28, 1986, Ser. No. 845,617

Claims priority, application Japan, Nov. 26, 1982, 57-206184

Int. Cl.[4] B05C *13/02*

U.S. Cl. 118—500 **2 Claims**



1. An exposure apparatus for exposing a pallet carrying a panel of a color CRT and a shadow mask, the apparatus comprising:

means for locating said panel with respect to said pallet including reference members for defining at least two planes perpendicular to a horizontal plane of said panel;

means for locating said pallet with respect to an exposure apparatus including reference members for defining at least two planes perpendicular to the horizontal plane of the panel and reference members for defining a plane parallel to the horizontal plane of said panel;

means for transferring said pallet through the exposure apparatus; and

means for attaching and detaching said shadow mask to and from said panel.

4,648,347

VACUUM DEPOSITING APPARATUS

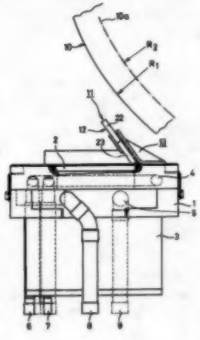
Hans Aichert, Hanau am Main; Volker Bauer; Albert Feuerstein, both of Neuberg, and Horst Ranke, Alzenau, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed May 29, 1985, Ser. No. 738,739

Claims priority, application Fed. Rep. of Germany, May 30, 1984, 3420245

Int. Cl.[4] C23C *13/08*

U.S. Cl. 118—720 **6 Claims**



1. Vacuum depositing apparatus comprising:

a substrate holder;

a vaporization crucible having a crucible opening having a projected surface; and

a mask lying in the path of a vapor stream, from a vaporized material, between said crucible opening and said substrate holder, said mask having a non-horizontal surface facing the vapor stream, said non-horizontal surface being heated to a temperature between the vaporization temperature and the solidification temperature of the vaporized material, and the lowest point of said surface of said mask lying within said projected surface of said crucible opening, said mask comprising a metal supporting structure having two sides, one side facing away from said crucible opening and an other side facing toward said crucible opening and a row arrangement of ceramic building blocks mounted on said other side of said supporting structure, said blocks having sides facing said crucible opening and forming said surface of said mask.

4,648,348

PLASMA CVD APPARATUS

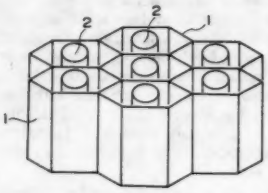
Yasutomo Fujiyama, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1985, Ser. No. 758,118

Claims priority, application Japan, Jul. 31, 1984, 59-160335

Int. Cl.[4] C23C *13/08*

U.S. Cl. 118—723 **2 Claims**



1. A plasma CVD apparatus for depositing a film on a substrate by creating a discharge between the substrate and an outer electrode arranged to face the surface of the substrate on which the film is deposited wherein said electrode is formed from a plurality of hexagonal pillar electrodes so that said electrode forms a honeycomb structure.

4,648,349

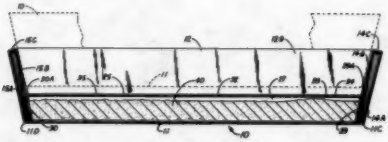
KITTY LITTER BOX

Conrad M. Larson, LaMoure, N. Dak., assignor to Midwest Green Products, Inc., Moorhead, Minn.

Filed Jul. 22, 1985, Ser. No. 757,617

Int. Cl.[4] A01K *1/00*

U.S. Cl. 119—1 **5 Claims**



1. A cat litter box comprising side and end wall means forming a generally rectilinear box enclosure having a bottom wall with side edges and end edges;

side wall means and end wall means integral with the bottom wall along the side and end edges thereof, respectively, said side wall means and end wall means each tapering upwardly and outwardly from the respective edges of the bottom wall to an upper box edge, and each being formed by double panels that are integral and folded against each other along a fold line, respectively, outer edges of the side wall panels and end wall panels extending down toward the bottom wall from the fold lines, respectively, said upper box edge being formed by the fold lines of the side wall panels and end wall panels and defining a peripheral dimension greater than the periphery of the bottom wall to permit the lower portions of similar boxes to be stacked within the upper portions of one box;

a cover wall fitting within said rectilinear box enclosure and closely engaging the side and end wall means forming said enclosure;

wall means extending downwardly and integral with the cover wall portions extending along the side and end wall panels to support said cover wall spaced with respect to the bottom wall of the rectilinear enclosure and in position below the upper edges of the box, said cover wall and said integral wall means forming an insert with an open bottom, the outer edges of the side wall panels and end wall panels extending toward the bottom wall beyond said cover wall; and

a filling of cat litter in the region below the cover wall.

4,648,350

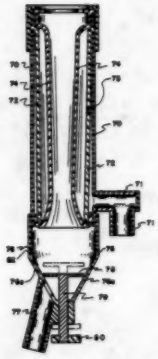
TEAT CUP ASSEMBLY WITH AUTOMATIC CUT OFF VALVE

Daniel O. Noorlander, 508 W. 630 South, Orem, Utah 84057

Continuation-in-part of Ser. No. 631,213, Jul. 16, 1984, Pat. No. 4,582,022. This application May 29, 1985, Ser. No. 738,879

Int. Cl.[4] A01J *5/08*

U.S. Cl. 119—14.32 **3 Claims**



1. A valve assembly for mounting in the outlet of a teat cup assembly comprising:

a valve housing connected to the outlet of a teat cup assembly, said housing having a nipple formed in the wall thereof for connection to a milk suction line;

a valve member mounted inside said valve housing, said valve member being adapted to seat on a valve seat within said housing when the interior of said housing which communicates with the outlet of the teat cup assembly is exposed to atmospheric pressure; and

a plunger means slidably mounted in the wall of said valve housing, said plunger means adapted to slide inwardly into said valve housing when the pressure in the interior of said housing which communicates with the outlet of the teat cup assembly falls below atmospheric pressure, said inward movement of said plunger means being adapted to dislodge said valve member from its seated position in the housing.

4,648,351

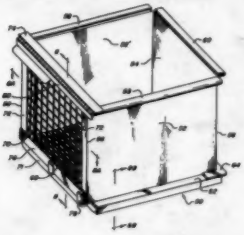
ANIMAL CAGE INSERT AND CONVERTIBLE ANIMAL CAGE

Michael Lanner, Stoughton, and Cynthia L. Coffey, Wayland, both of Mass., assignors to The Beth Israel Hospital Association, Boston, Mass.

Division of Ser. No. 586,273, Mar. 5, 1984, Pat. No. 4,524,721. This application Jun. 3, 1985, Ser. No. 740,877

Int. Cl.[4] A01K *1/03*

U.S. Cl. 119—17 1 Claim



1. A process for converting a hanging animal cage from being appropriate for one size animal species to a cage suitable for use with a different size animal species, said process comprising:

(a) providing a cage having two solid sides, a solid back, and means for holding front and bottom grid panels;

(b) providing a plurality of insertable front and bottom panels of different grid sizes, said grid size determined to be the appropriate grid to safely and hygienically cage a particular size animal species;

(c) determining which animal species is to be caged in a particular cage; and

(d) inserting panels of appropriate grid size for the particular animal species to be caged into said means for holding the front and bottom panels of said cage.

4,648,352

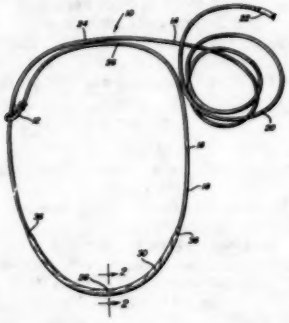
WEIGHTED HEELING ROPE

R. Leon Smith, Rte. 1, Box 25, Texico, N. Mex. 88135

Filed Jan. 24, 1986, Ser. No. 822,281

Int. Cl.[4] A01K *29/00*

U.S. Cl. 119—153 10 Claims



1. A weighted heeling rope comprising a length of line having a hondo formed on one end through which a major length portion of the line extends with the remaining minor length portion of the line forming a loop and with the line slidably received through said hondo, whereby the loop may be tightened about an object about which it passes responsive to said line being tensioned between said hondo and the other end thereof, said minor length portion including an intermediate short length portion thereof which is weighted, substantially evenly throughout the length of said short length portion.

4,648,353

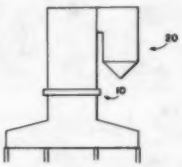
FLUIDIZED SAND EXPANSION JOINT

Wadie F. Gohara, Barberton, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed May 31, 1985, Ser. No. 739,643

Int. Cl.[4] F22B *13/14*

U.S. Cl. 122—4 D 10 Claims



1. An expansion joint for a boiler having a first part which moves with respect to a second part due to expansion, comprising:

a trough defining an upwardly open space, said trough adapted to be connected to the first part of the boiler, said trough having one side wall comprising a bent portion of a bottom supported tube wall, said bottom supported tube wall forming the first part of the boiler, said bent portion of said bottom supported tube wall defining a bottom of said trough, said trough having an opposite side wall comprising a refractory lined steel plate connected to said bent portion of said bottom supported tube wall;

a sealing projection extending into the trough space and adapted to be connected to the second part of the boiler, said sealing projection comprising a sealing tube wall made of a plurality of connected tubes;

fluidizable solid granular material in said trough space and partly covering said sealing projection; and

fluidizing medium supply means connected to said sealing projection for supplying fluidizing medium into said granular material to fluidize at least a portion of said granular material adjacent said sealing projection for permitting relative movement of said sealing projection with respect to said trough whereby a support and seal can be maintained between said projection and said trough during relative movement between the first and second parts of the boiler, said fluidizing medium supply means comprising a header connected to an upper end of said tubes and said tubes including perforations at lower ends thereof for supplying fluidizing medium into said granular material.

4,648,354

STEAM GENERATING APPARATUS HAVING A FEEDWATER HEADER

Alain H. Holcblat, Issy les Moulineaux; Patrick Sundheimer, St Naur des Fosses, and Yves Pascal, Nanterre, all of France, assignors to Framatome, Courbevoie, France

Filed Jul. 2, 1986, Ser. No. 881,306

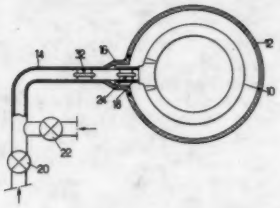
Claims priority, application France, Jul. 2, 1985, 85 10086; Jan. 29, 1986, 86 01259

Int. Cl.[4] F22B *1/02*

U.S. Cl. 122—32 11 Claims

1. Steam generator for a nuclear power plant comprising a pressure vessel; elongated exchange elements in said vessel; a steam plenum at the upper part of said vessel; a feedwater header located within said vessel above said elongated exchange elements and having passages for the flow of feed water into the vessel; and a feed water intake pipe passing

through the wall of the vessel, wherein said pipe contains, in a horizontal portion thereof, at least one deflector comprising an



axial hub and a plurality of helical blades connecting the hub to the wall of the pipe and whose length represents at least one half of a winding pitch.

4,648,355

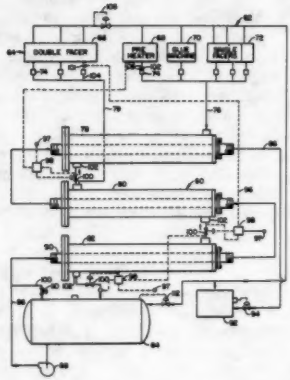
HEAT EXCHANGER ARRAY FOR A STEP DOWN RETURN OF CONDENSATE

Martin Bekedam, 103 Brookline, Moraga, Calif. 94556

Filed Nov. 18, 1985, Ser. No. 798,923

Int. Cl.[4] F22D *1/00, 1/32*

U.S. Cl. 122—412 **3 Claims**



1. A heat exchanger array for step down return of condensate in a vapor system having a vaporizer and a plurality of vapor sevices of different temperature and pressure having condensate reservoirs of relatively higher and lower pressures and temperatures, the array comprising:

a plurality of straight tube heat exchangers each of which comprises a straight outer tubular shell with an inside wall, having a fluid inlet and a communicating fluid outlet, and, an inner conduit assembly with fluid inlet and a communicating outlet concentrically mounted within the outer tubular shell, the conduit assembly having an inner tube with an external fin structure displaced from the inside wall and a periodic baffle structure proximate to the inside wall of the tubular shell;

wherein the straight tube heat exchangers are arranged with at least one heat exchanger having an inlet connected to a reservoir of relatively higher temperature and pressure and a communicating outlet connected to the inlet of at least one other heat exchanger the inlet of which is additionally connected to a condensate reservoir of relatively lower temperature and the communicating outlet of which is connected to a common return for the combined condensate, the array having further, pressure control means for regulating a pressure drop between the exchangers and cooling means for cooling the condensate in the exchangers.

4,648,356

EVAPORATIVE COOLING SYSTEM OF INTERNAL COMBUSTION ENGINE

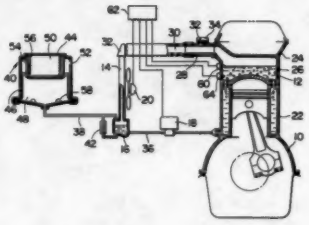
Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 7, 1985, Ser. No. 742,318

Claims priority, application Japan, Jun. 12, 1984, 59-120112

Int. Cl.[4] F01P *3/22*

U.S. Cl. 123—41.21 **14 Claims**



1. An evaporative cooling system of an internal combustion engine, comprising:

means defining in the engine a coolant jacket into which coolant is introduced in liquid state through an inlet port formed in the engine and from which the coolant is discharged in gaseous state through an outlet port formed in the engine;

a condenser into which the gaseous coolant from the coolant jacket of the engine is introduced to be liquefied;

a lower tank connected to said condenser to collect therein the coolant which has been liquefied by said condenser, said lower tank having a bottom which is submerged in the liquefied coolant;

an electric pump by which the liquid coolant in said lower tank near the bottom of the same is pumped into the coolant jacket through said inlet port of the engine;

conduit means connecting said outlet port, said condenser, said lower tank, said electric pump and said inlet port thereby to form a coolant circulation circuit; and

a capacity variable tank fluidly connected through a conduit to said lower tank to temporarily capture therein air remaining in said coolant circulation circuit during operation of the cooling system, said conduit being connected to an upper portion of said tank, said upper portion being empty of the liquid coolant under normal operation of the cooling system.

4,648,357

COOLING SYSTEM FOR AUTOMOTIVE ENGINE OR THE LIKE

Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 7, 1986, Ser. No. 816,899

Claims priority, application Japan, Jan. 8, 1985, 60-1212; Mar. 5, 1985, 60-43260; May 30, 1985, 60-117184

Int. Cl.[4] F01P *3/22*

U.S. Cl. 123—41.27 **17 Claims**

1. In an internal combustion engine having a structure subject to high heat flux,

(a) a cooling system for removing heat from said engine comprising:

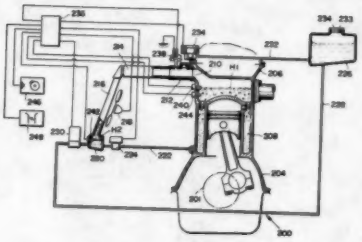
a cooling circuit which includes:

a coolant jacket formed about said structure, said coolant jacket being arranged to receive coolant in liquid form and discharge same in gaseous form;

a radiator which fluidly communicates with said coolant jacket by way of a coolant transfer conduit and in which gaseous coolant produced in said coolant jacket is condensed to its liquid form;

a return conduit leading from said radiator to said coolant jacket for returning coolant condensate from said radiator to said coolant jacket; and

a return pump disposed in said return conduit, said return pump being selectively energizable to maintain



a predetermined level of coolant in said coolant jacket;

(b) a reservoir the interior of which is maintained constantly at atmospheric pressure; and

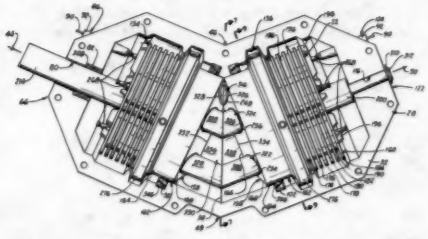
(c) a volume control pump fluidly interposed between said reservoir and said cooling circuit for pumping coolant between said cooling circuit and said reservoir in a manner which varies the amount of coolant in said cooling circuit.

4,648,358

ROTARY VEE ENGINE

Robert W. Sullivan, Snyder; Tommie J. Holder, Mountain Park, and Max F. Buchanan, Roosevelt, all of Okla., assignors to Sullivan Engine Works, Inc., Snyder, Okla.

Filed Jul. 22, 1985, Ser. No. 757,270
Int. Cl.[4] F02B *57/06*
U.S. Cl. 123—43 A **18 Claims**



1. In an internal combustion engine of a type comprising:

a housing;

two cylinder blocks mounted in the housing for rotation of one cylinder block about a first rotation axis and rotation of the other cylinder block about a second rotation axis angled with respect to the first rotation axis so that the rotation axes are angled toward one side of the engine, each cylinder block having a plurality of cylinders formed therein to intersect the end of the cylinder block adjacent the other cylinder block and to extend therefrom into the cylinder block parallel to the rotation axis of the cylinder block; and

a plurality of angled pistons, each piston having a portion disposed in a cylinder of one cylinder block and a portion disposed in a cylinder in the other cylinder block for orbital motion of the pistons coordinately with rotation of the cylinder blocks;

the improvement wherein a central bore is formed through each of the cylinder blocks to extend along the rotation axis for the cylinder block; and wherein the engine further comprises:

an angled support shaft having end portions extended axially outwardly of the cylinders of the cylinder blocks and supported by the housing and having a portion extending through each cylinder block along the rotation axis of the cylinder block; and

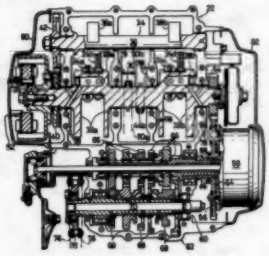
bearing means for rotatably and axially supporting each of the cylinder blocks on said portions of the support shaft.

4,648,359

INTERNAL COMBUSTION ENGINE FOR MOTORCYCLE

Toshifumi Ito, Tokorozawa, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 538,902, Oct. 4, 1983, abandoned. This application Apr. 3, 1986, Ser. No. 847,118
Claims priority, application Japan, Oct. 6, 1982, 57-174449
Int. Cl.[4] F01L *1/46*
U.S. Cl. 123—90.31 **6 Claims**



1. In an internal combustion engine mounted on a motorcycle, which comprises an engine casing structure connected to a frame structure of said motorcycle:

a crankshaft rotatable about an axis fixed with respect to said engine casing structure and axially extending in a direction transverse to a forward and aft direction of the motorcycle, said crankshaft having at least one crankpin portion provided with a pair of crank weight webs projecting radially away therefrom;

first and second banks of power cylinders mounted on said engine casing structure above said crankpin portion, said first and second banks of power cylinders respectively inclined forwardly and rearwardly from a vertical plane which passes through the rotational axes of said first and second power cylinders is less than 90 degrees about the rotational axis of said crankshaft;

first and second pistons respectively accommodated with said first and second cylinders;

first and second connecting rods respectively interconnecting between said first and second pistons and said crankpin portion;

at least one camshaft rotatable about an axis substantially parallel with the rotational axis of said crankshaft; and

camshaft drive means operative to provide driving engagement from said crankshaft to said camshaft, the improvement which comprises:

a single balance shaft positioned within said engine casing and forwardly of said crankshaft and below said first power cylinder and being rotatable about an axis with respect to said engine casing structure and substantially parallel with the rotational axis of said crankshaft;

a balancing weight mounted on said balance shaft substantially aligned with said crankpin portion; and

balancer drive means for providing synchronized driving

engagement from said crankshaft to said balance shaft which rotates at the same speed as said crankshaft.

4,648,360

HYDRAULIC VALVE TAPPET

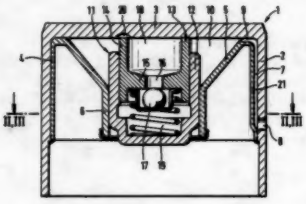
Georg Schaeffler, Herzogenaurach, Fed. Rep. of Germany, assignor to Motomak Motorenbau, Maschinen-und Werkzeugfabrik Konstruktionen GmbH, Fed. Rep. of Germany

Filed Dec. 24, 1985, Ser. No. 813,249

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1985, 3500425

Int. Cl.[4] F01L *1/24*

U.S. Cl. 123—90.55 **2 Claims**



1. In a hydraulic valve tappet arranged in a bore of a cylindrical guide bore of a cylinder head of an internal combustion engine comprising a cup shaped housing (1) comprising a hollow outer wall (2) closed at one end by an end member (3) and a cylindrical sleeve (4) bearing against it in its bore, the cylindrical sleeve changing into an annular element (5) near end member (3), the annular element (5) carrying in its bore a guide sleeve (6) running coaxially with the outer wall (2), an oil duct (7) formed in the longitudinal direction at a peripheral location between outer wall (2) and cylindrical sleeve (4) starting from an oil feed bore (8) in outer wall (2) and terminating in an annular outer oil reservoir (10) at the junction between cylindrical sleeve (4) and the annular element (5), the outer oil reservoir (10) being defined by end member (3) of housing (1), annular element (5) and a hydraulic compensating element (11) comprised of outer cylindrical element (12) longitudinally moveable in guide sleeve (4) and closed at its end away from end member (3) of housing (1), and provided in its bore with a piston element (13) longitudinally moveable with little play, the piston element (13) comprising a hollow cylindrical casing (14) provided with a partition (15) between its ends having a through bore (16) closed by a check valve (17) and one end thereof bears against the inner surface of end member (3) to define a central oil reservoir (18) extending in front of check valve (17) and its other end together with cylindrical element (12) defines a high pressure oil chamber 19 closed by check valve (17) and with a recess (20) serving as oil member opening provided at a peripheral location of the contact area of piston element (13) and end member (3) on the inner surface of member (3) overlapping the contact area, the improvement comprising that the opening (9) of oil duct (7) into the annular outer oil reservoir (10) and recess (20) on the inner surface of end member (3) are diametrically opposite each other.

4,648,361

HEATING DEVICE

Bernard C. Hales, Egham, England, assignor to Lucas Industries public limited company, Birmingham, England

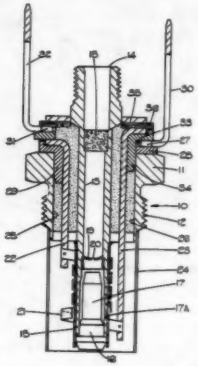
Filed Oct. 4, 1985, Ser. No. 784,541

Claims priority, application United Kingdom, Oct. 16, 1984, 8426125; Jul. 2, 1985, 8516691

Int. Cl.[4] F02N *17/02*

U.S. Cl. 123—179 H **8 Claims**

1. An electric starting aid for an internal combustion engine and of the kind in which liquid fuel is vaporized within the aid and is ignited to provide a flame for heating air flowing to an engine, the aid comprising a unitary metal body adapted to be secured in use in the air inlet manifold of the engine, said body part defining a reduced tubular end portion, a fuel inlet on the body communicating with said tubular end portion, means closing the end of said tubular end portion remote from the body, and through which in use fuel can flow to the exterior surface of said end portion, a monolithic electrically insulating sleeve located about said end portion, the sleeve being pervious to fuel so that fuel flowing to the exterior surface of said end portion flows into and through said sleeve, said monolithic sleeve extending continuously from adjacent to the body to adjacent to said means closing the end of said tubular end portion, an electric heating element mounted about said sleeve, and means connected to the ends of the element to allow electric current to be passed therethrough, said heating element in use vaporizing fuel passing through the sleeve to form an ignitable air/fuel mixture.



4,648,362

DECOMPRESSION ARRANGEMENT FOR A COMBUSTION ENGINE

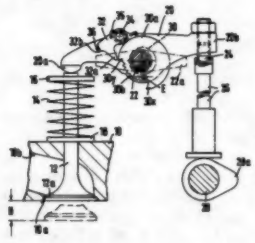
Siegfried Kastlunger, Schaerding, Austria, assignor to Motorenfabrik Hatz GmbH & Co. KG, Ruhstorf, Fed. Rep. of Germany

Filed Jan. 17, 1986, Ser. No. 820,489

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1985, 3506964

Int. Cl.[4] F01L *13/08*

U.S. Cl. 123—182 **6 Claims**



1. A decompression apparatus for an internal combustion engine having a valve controlled by a rocker arm, comprising an adjustable eccentric decompression cam which serves as a fulcrum for the rocker arm, and a switching member which is operable by the rocker arm and moves the eccentric cam in

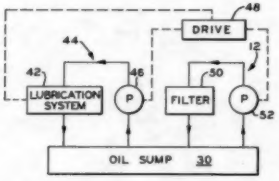
progressive steps from a decompression position in a direction toward a non-decompression position, wherein the switching member is supported on the rocker arm and, upon termination of decompression, is brought into a non-operative position by a first projection provided on the eccentric cam and is held in this non-operative position by a releasable locking mechanism, and wherein decompression is initiated when a further projection provided on the eccentric cam releases the locking mechanism and moves the switching member from said non-operative position into said decompression position.

4,648,363

LUBRICATING OIL FILTRATION SYSTEM FOR AN ENGINE

Peter G. Kronich, Sheboygan, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Nov. 12, 1985, Ser. No. 797,157
Int. Cl.[4] F01M *1/00*
U.S. Cl. 123—196 R **15 Claims**



1. An oil filtering system for an engine including a drive shaft, a lubricating system for the engine, an oil sump, a governor for controlling a throttle of the engine, said governor including driven means drivingly interconnected with said drive shaft, said oil filtering system comprising:

a housing;

an oil inlet means defined in said housing in flow communication with said oil sump;

an oil outlet means defined in said housing;

an oil filtering means disposed adjacent said oil sump and having an inflow orifice and an outflow orifice;

means defining an oil filtering flow circuit separate from said lubricating system of the engine, said circuit means interconnecting said oil outlet means in said housing and said inflow orifice and interconnecting said outflow orifice and said oil sump; and

oil pump means mounted in said housing and drivingly interconnected with said governor driven means such that, when said pump means is driven by said governor driven means, said pump means causes oil flow from said sump into said housing via said inlet means and from said housing through said oil filtering means and back to said sump.

4,648,364

ENGINE PROTECTION APPARATUS

William H. Wills, 115 Lakeview Dr., New Port Richey, Fla. 33552

Filed Jul. 8, 1985, Ser. No. 752,801
Int. Cl.[4] F02B *77/08*
U.S. Cl. 123—198 D **15 Claims**

1. An engine protection apparatus, comprising:

monitoring means for monitoring a plurality of operating conditions of the engine;

indication providing means associated with said monitoring means for providing an indication of engine malfunction;

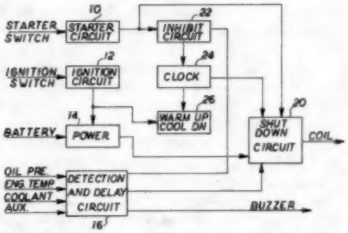
engine disabling means associated with said monitoring means and said indication providing means for disabling the engine in the event of malfunction and after engine cool down and warm up periods;

time generating means for generating a time base for all timed functions of the apparatus;

inhibiting means associated with said engine disabling means and said time generating means for inhibiting the engine disabling operation during engine start up periods;

starter switch closure detecting means associated with said inhibiting means for detecting the closure of the starter switch of the engine;

ignition switch closure detecting means associated with said



inhibiting means for detecting the closure of the ignition switch;

means associated with said starter switch closure detecting means, said ignition switch closure detecting means, said engine disabling means and said time generating means for providing monitored warm up periods for the engine; and

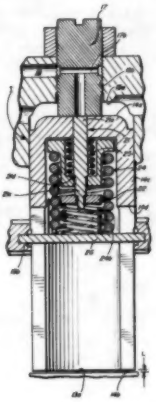
means associated with said starter switch closure detecting means, said ignition switch closure detecting means, said engine disabling means and said time generating means for providing monitored cool down periods for the engine.

4,648,365

ENGINE COMPRESSION BRAKING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Michael A. Bostelman, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Nov. 26, 1985, Ser. No. 802,045
Int. Cl.[4] F02D *13/04*
U.S. Cl. 123—321 **9 Claims**



1. A braking system for an internal combustion engine having a gas compressing power piston reciprocally mounted in an engine cylinder having an exhaust valve in communication therewith, comprising

(a) power mode operating means for cyclically opening the

exhaust valve in a first predetermined timed relation with a power stroke of said power piston when said engine is operating in a power mode, said operating means having a valve opening surface displaceable upon the application of a predetermined force to open the exhaust valve; and

(b) a braking mode operating means for cyclically opening the exhaust valve in a second predetermined timed relation with the movement of said power piston to effect operation of the engine in a braking mode by cyclically displacing said valve opening surface to release compressed gas pressure from within the engine cylinder in a selected time sequence with the power stroke of said power piston, said braking mode operating means including

(i) a hydraulically responsive actuating member reciprocally mounted within an auxiliary engine cylinder, said actuating member having a force applying surface movable between retracted and fully extended positions relative to said valve opening surface; when in said retracted position, said force applying surface being spaced a predetermined lash distance from said valve opening surface whereby said surfaces continually remain in non-contacting relation when the engine is operating in a power mode; when in a fully extended position, said force applying surface having moved a distance greater than said predetermined lash distance and displacing said valve opening surface to effect opening of said exhaust valve during said braking mode of engine operation;

(ii) adjustable means mounted on said auxiliary engine cylinder and coacting with said actuating member for selectively varying the predetermined lash distance, said actuating member being biased into engagement with said adjustable means;

(iii) a source of pressurized hydraulic fluid communicating with said auxiliary cylinder;

(iv) a dump port for hydraulic fluid communicating with said auxiliary cylinder;

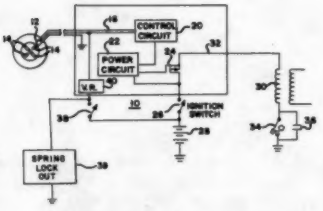
(v) valve means adjustably carried on said actuating member and being biased independently thereof into closing engagement with said dump port when said actuating member is engaging said adjustable means and while traveling said predetermined lash distance away from said adjustable means; said valve means moving as a unit with said actuating member and opening said dump port when said actuating member has traveled from said adjustable means more than said predetermined lash distance whereby said actuating member and said valve means automatically resume positions wherein said member abuttingly engages the adjustable means and the valve means closes the dump port.

4,648,366

VEHICLE SPEED CONTROL DEVICE

Walter E. Thornton-Trump, P.O. Drawer 308, Elberta, Ala. 36530

Filed May 6, 1985, Ser. No. 730,992
Int. Cl.[4] B60K *31/00*; F02P *9/00*
U.S. Cl. 123—335 **16 Claims**



1. Apparatus for automatically limiting the speed of a vehicle powered by an internal combustion engine having a spark ignition system with an ignition coil, comprising:

sensor means for generating a speed signal directly representative of the speed of the vehicle comprising a series of speed signal pulses having a pulse repetition frequency proportional to the speed of the vehicle;

control means for converting speed signal pulses into a DC voltage proportional to the vehicle speed, means for comparing the DC voltage to a predetermined DC voltage having substantially zero AC components representative of a predetermined maximum speed and for generating a difference signal in response thereto, and means for generating a pulse-width modulated control signal responsive to the difference signal;

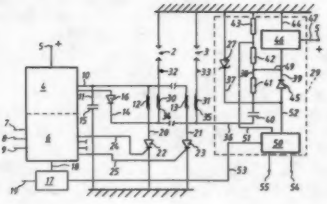
power means responsive to the control signal for intermittently interrupting the ignition system.

4,648,367

METHOD AND APPARATUS FOR DETECTING ION CURRENT IN AN INTERNAL COMBUSTION ENGINE IGNITION SYSTEM

Per Gillbrand, Mariefred; Hans Johansson, and Jan Nytomt, both of Amal, all of Sweden, assignors to Saab-Scania Aktiebolog, Södertälje, Sweden

Filed Dec. 18, 1985, Ser. No. 810,186
Claims priority, application Sweden, Dec. 19, 1984, 8406457
Int. Cl.[4] F02P *17/00*; G01M *15/00*
U.S. Cl. 123—425 **14 Claims**



1. A method of detecting ion current in at least one ignition circuit included in an ignition system of a multicylinder internal combustion engine, the ignition in the cylinders following a certain order controlled by an electronic unit, in which system a measuring voltage is applied to the ignition circuit and a measuring device is used to detect ion current possibly occurring in the ignition circuit, characterized in that

a substantially constant measuring voltage is applied to the ignition circuit in a ground connection between one end of a secondary winding of an ignition coil and a measuring capacitor disposed in the ground connection, the other end of the secondary winding being connected to a central electrode of an ignition means for igniting a fuel-air mixture in one of the engine cylinders, and in that ion current in the ignition circuit is detected in detecting means connected to the ground connection.

4,648,368

FUEL INJECTION SYSTEM

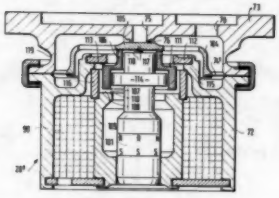
Karl Gmelin, Ingelfingen; Hans Kubach, Korntal; Wolfgang Maisch, Schwieberdingen; Klaus-Jürgen Peters, Affalterbach, and Peter Schelhas, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 357,110, Mar. 11, 1982, Pat. No. 4,545,353. This application Jun. 24, 1985, Ser. No. 747,755

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1981, 3109560

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—454 4 Claims



1. A fuel injection system for mixture-compressing internal combustion engines with externally-supplied ignition, said system further having at least one housing and including metering valves disposed in a fuel supply line for metering a quantity of fuel which is at a specific ratio to the quantity of air aspirated by the engine, said metering operation taking place at a pressure difference which is constant but which can be varied in accordance with operating characteristics of said engine, a regulating valve having a movable valve element disposed downstream of each said metering valve and arranged to regulate the pressure difference at the respective metering valve, said movable valve element further being capable of exposure on one side to the fuel pressure downstream of the respective metering valve and on the other side thereof to the pressure in a control pressure line defined on one end by a control pressure valve triggerable in accordance with operating characteristics of said engine and on the other end by a control throttle, characterized in that said control pressure valve has an impact plate coupled with an armature, said impact plate further comprises a guide body embodied in cuplike fashion and connected with said armature, and said guide body is supported in an axially displaceable manner on a guide diaphragm, which is attached to said housing in a plate in which a radial force which acts upon the armature extends, said armature further being located within an electromagnetic field of an electromagnetic coil and a permanent magnetic field of a permanent magnet arranged to extend partially in the same direction and partially in the opposite direction and said impact plate further arranged to cooperate with a control valve seat which communicates with said fuel supply line, wherein said armature has first and second end faces and further comprises a cylinder, a first air gap formed in an axial direction between said first end face of said armature and a core of said electromagnetic coil, and a second air gap is formed between said second end face and a conductor piece, and further wherein a pole shoe of said permanent magnet protrudes into said armature in such a manner that said electromagnetic field of said electromagnetic coil and said magnetic field of said permanent magnet extend in the same direction in one of said air gaps and in the opposite direction in the other of said air gaps.

4,648,369

PRESSURE VALVE

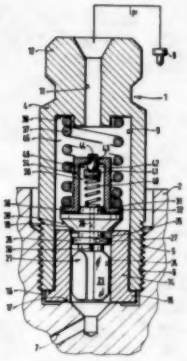
Peter Wannenwetsch, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 8, 1985, Ser. No. 720,771

Claims priority, application Fed. Rep. of Germany, May 10, 1984, 3417210

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—467 9 Claims



1. A pressure valve for installation in a supply line between a pump work chamber of a fuel injection pump and an injection valve in an internal combustion engine supplied by said fuel injection pump, comprising a valve seat body having a valve seat and a passageway in which a pressure valve closing member is guided, said closing member having a portion disposed between said valve seat and a compression spring supported in a fixed manner in a spring chamber, a sealing face on said closure member arranged to cooperate with said valve seat, a return-feed collar on said closure member arranged to pass into said passageway connected to said pump work chamber, a relief conduit in said closure member, a throttle member, said relief conduit arranged to be connected to said spring chamber via said throttle member, and to a part of said passageway being permanently connected to said pump work chamber upstream of said return-feed collar, said throttle member having a check valve, a closing spring means supported on said valve closing member and said return-feed collar being provided with a throttle means on its circumference arranged to connect adjacent parts of said passageway.

4,648,370

METHOD AND APPARATUS FOR CONTROLLING AIR-FUEL RATIO IN INTERNAL COMBUSTION ENGINE

Nobuyuki Kobayashi, and Takashi Hattori, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 3, 1985, Ser. No. 730,207

Claims priority, application Japan, May 7, 1984, 59-89247

Int. Cl.[4] F02M *51/00*; F02D *9/06*

U.S. Cl. 123—489 6 Claims

1. A method for controlling an air-fuel ratio in an internal combustion engine having a throttle valve therein, comprising the steps of:

detecting a concentration of a specific composition in an exhaust gas of the engine;

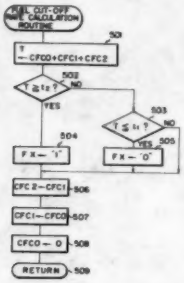
calculating a predetermined target air-fuel ratio with respect to a stoichiometric air-fuel ratio in accordance with first predetermined parameters of said engine;

controlling a feedback of the air-fuel ratio of said engine in accordance with the detected concentration of the spe-

cific composition so that the air-fuel ratio of said engine is brought close to the predetermined target air-fuel ratio;

performing a fuel cut-off operation upon said engine in accordance with second predetermined parameters of said engine;

calculating a fuel cut-off ratio as a total time of fuel cut-off operation of the engine during a definite time period;



determining whether the fuel cut-off ratio is larger than a predetermined value; and

stopping the feedback control of the air-fuel ratio of said engine when the fuel cut-off ratio is larger than the predetermined value.

4,648,371

METHOD OF CONTROLLING A FUEL INJECTION APPARATUS

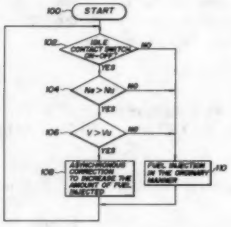
Keisuke Kaneta, Hamamatsu, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Dec. 12, 1985, Ser. No. 808,412

Claims priority, application Japan, Dec. 28, 1984, 59-274941

Int. Cl.[4] F02D *41/10*

U.S. Cl. 123—492 **3 Claims**



1. A method of fuel injection control for electronically controlling an amount of fuel injected into an internal combustion engine provided in a vehicle, including the step of performing asynchronous fuel injection in the case where at least the following three conditions are satisfied:

(1) the engine has shifted from an idling operating state to a running operating state;

(2) the rotating speed of the engine is higher than a predetermined rotating speed; and

(3) the velocity of the vehicle is higher than a predetermined velocity.

4,648,372

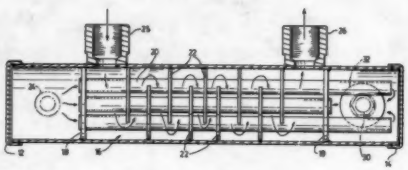
FUEL PRE-HEATER

Jocelyn P. Michaud, 429 Sheraton Road, Burlington, Ontario, Canada (L7L 5M4), and Leonard A. Brennan, 634 Blue Forest Hill, Burlington, Ontario, Canada (L7L 4H3)

Filed Apr. 23, 1985, Ser. No. 726,552

Int. Cl.[4] F02M *31/10*; F02G *5/00*

U.S. Cl. 123—557 **3 Claims**



1. A fuel preheater for a fluid fuel for use in an internal combustion engine having a liquid coolant system comprising, in combination:

an elongated closed housing having a coolant inlet at one end and a coolant outlet at the other end;

a liquid-tight transverse partition disposed within said housing in proximity to each of said inlet and said outlet between said inlet and said outlet defining an inlet compartment, a central compartment and an outlet compartment;

heat transfer elements comprised of a plurality of spaced-apart tubes formed of a thermoconductive material extending between said partitions through the central compartment and communicating the inlet compartment with the outlet compartment for the flow of heated coolant therethrough, a pair of said spaced-apart tubes extending into the outlet compartment;

a fuel inlet and a fuel outlet formed on the housing for the flow of fuel through the central compartment for heating of said fuel by the heat transfer elements; and

normally-open thermostatically-controlled valve means operatively positioned in said outlet chamber are seated on means provided on said pair of spaced-apart tubes for closing the coolant outlet when the coolant reaches a predetermined temperature whereby the fuel is heated to a predetermined maximum temperature.

4,648,373

INTAKE MANIFOLD FOR INTERNAL COMBUSTION ENGINE HAVING EXHAUST GAS RECIRCULATION SYSTEM

Yoshikazu Noguchi; Okazaki; Tatsuhisa Yokoi, Toyota; Eisaku Takeya, Aichi, and Hideyuki Osawa, Obu, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, both of, Japan

Filed Aug. 19, 1985, Ser. No. 766,783

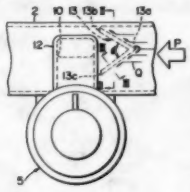
Claims priority, application Japan, Sep. 29, 1984, 59-147735[U]

Int. Cl.[4] F02M *25/06*

U.S. Cl. 123—568 **3 Claims**

1. An intake manifold for an internal combustion engine equipped with an exhaust gas recirculation system for introducing a part of the exhaust from an exhaust gas passage through an EGR pipe into an intake manifold, said intake manifold being provided with an EGR gas outlet port opened thereto and connected to said EGR pipe, and said intake mani-

fold being provided with a rib formed on and extending along an inner wall of said intake manifold at a position upstream of said EGR gas outlet, in such a manner that said rib is obliquely



extended with respect to an air flow direction so as to guide oil flowing downward along said inner wall away from said EGR gas outlet port.

4,648,374

AIR INTAKE SIDE SECONDARY AIR SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

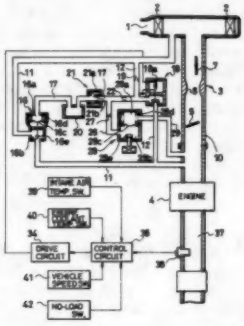
Hideo Kobayashi, Kawagoe, and Norio Tomobe, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1985, Ser. No. 780,165

Claims priority, application Japan, Sep. 27, 1984, 59-146330[U]

Int. Cl.⁴ F02M *23/08, 23/10*

U.S. Cl. 123—587 **3 Claims**



1. In an air intake side secondary air supply system for an internal combustion engine having a choke valve and a throttle valve in an intake air passage, which system is adapted to supply an air intake side secondary air into an intake air passage downstream of the throttle valve by a control valve and in response to an operating condition of the engine during a cold operation of the engine, wherein the improvement comprises means for detecting a no-load operating state of the engine during said cold operation of the engine in which the choke valve is actuated to close the intake air passage, and means for stopping a supply of the air intake side secondary air upon detection of the non-load operating state so as to enrich an air-fuel mixture supplied to the engine.

4,648,375

CAPACITOR IGNITION SYSTEM

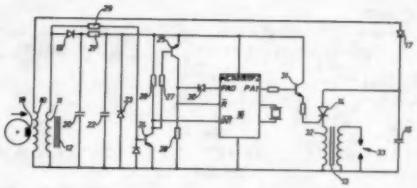
Bo C. Andreasson, Göteborg, and Sven I. Fajersson, Kållered, both of Sweden, assignors to AB Electrolux, Sweden

Filed May 3, 1985, Ser. No. 730,433

Claims priority, application Sweden, May 11, 1984, 8402557

Int. Cl.⁴ F02P *5/15*

U.S. Cl. 123—602 **7 Claims**



1. A capacitor discharge system for an internal combustion engine, comprising a magnetic charging system including a first winding on an iron core, a capacitor, means coupling said capacitor to said first winding, magnet means movable with respect to said core in synchronization with the rotation of said engine for generating a voltage in said first winding for charging said capacitor via said coupling means, an ignition coil having a primary winding and a secondary winding for producing an ignition voltage adapted to be applied to a spark plug, an ignition switch coupled to discharge said capacitor through said primary winding, a logic circuit connected to energize said ignition switch, a second coil on said core, rectifier means and filter circuit means coupled to said second coil for generating an operating voltage, means applying said operating voltage to said logic circuit, an amplifier connected to said logic circuit, said amplifier being coupled to said second coil for applying a reference position signal to said logic circuit of the rotation of said engine, said logic circuit comprising means for controlling the time of energization of said ignition switch for controlling the spark advance of said engine.

4,648,376

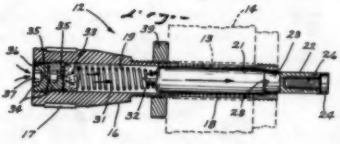
SELF CLEANING PRESSURE BUTTON

Charles A. Saunders, 8380 - 36th Ave., Columbus, Nebr. 68601

Filed Jun. 28, 1985, Ser. No. 749,808

Int. Cl.⁴ F41D *10/00*

U.S. Cl. 124—41 A **1 Claim**



1. An improved pressure button for an archery bow comprising:

a housing adapted to extend through an opening in a window section of a bow disposed above a bow handle;

means for forming a chamber within said housing, said chamber means having an opening on one end thereof;

a plunger slidably disposed in said chamber, said plunger having one end thereof extending through said opening and forming a small space between said one end of the plunger and said housing;

arrow contact means disposed on one end of said plunger for contacting an arrow supported on an arrow rest attached to a bow handle;

means for biasing said plunger in one direction;

stop means for preventing said plunger from moving too far in said one direction;

means for venting air into said chamber;

pump means for causing air to be forced out of said small space between said one end of the plunger and said housing and past said one end of the plunger when said plunger is pushed in the other direction against the bias of said biasing means for forcing dirt from said space to insure that the plunger remains clean and in good working order; and

means for filtering the air passing through said venting means to prevent dirt from entering said chamber.

4,648,377

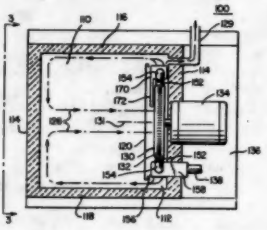
GAS CONVECTION OVEN AND HEAT EXCHANGER THEREFOR

Richard H. Van Camp, Tipp City, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed May 1, 1986, Ser. No. 858,615

Int. Cl.[4] F24C *15/32*

U.S. Cl. 126—21 A **12 Claims**



1. A gas convection oven comprising:

a heating chamber including a gas combustion chamber formed therein;

convection blower means positioned within said combustion chamber for circulating air through said heating chamber and said combustion chamber, said blower means having a low pressure inlet located centrally of said combustion chamber for receiving air from said heating chamber and forcing said air through said combustion chamber and back into said heating chamber around the outer edges of said combustion chamber;

gas burner means extending into said combustion chamber for combusting an appropriate mixture of gas and air, said gas burner means including diverter means for substantially equally dividing and directing flame and combustion products into two different directions; and

bifurcated heat exchanger means for conducting therethrough the products of combustion from said gas burner means, said heat exchanger means having first and second tubular passages substantially aligned with and encompassing said convection blower means, said first and second passages having inlets aligned with said two different directions for receiving the flame and combustion products divided by said diverting means, and terminating in outlet means for extending said first and second passages into the low pressure inlet of said convection blower means whereby air drawn into said blower means is heated both by mixture with combustion products from said outlet means of said heat exchanger and also by passage over the surfaces of said first and second passages as the mixture of air and combustion products is circulated through said combustion chamber and back into said heating chamber.

4,648,378

ROASTER

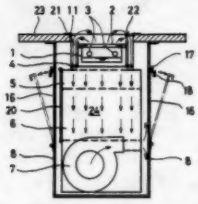
Eikichi Nishikawa, Moriguchi, Japan, assignor to Yamaoka Industry Corporation, Osaka, Japan

Filed Jan. 7, 1986, Ser. No. 816,877

Claims priority, application Japan, Mar. 15, 1985, 60-37930[U]

Int. Cl.[4] A21B *1/00*

U.S. Cl. 126—21 A **2 Claims**



1. A roaster in which smoke given off by food being cooked by said roaster is treated, comprising:

a top board having an opening therethrough;

an inner case mounted in said opening having a gas burner disposed therein;

a rectangular griddle means mounted on top of said inner case;

an outer case having wall means surrounding and spaced from said inner case for forming a smoke intake flue between said wall means and said inner case;

smoke inlet ports located adjacent the periphery of said griddle means open to and communicating with said smoke intake flue;

a smoke purifier means disposed under and coupled to said outer case;

an electric powered fan disposed under and coupled to said smoke purifier means for drawing air and said smoke through said smoke inlet port, said intake flue and said smoke purifier means;

a box shaped support saddle having walls for supporting said top board and surrounding said outer case, said smoke purifier means and said fan for forming a space between said walls and said outer case, said smoke purifier means and said fan, said fan expelling said air and said smoke drawn through said air purifier means into said space;

said walls including transverse side walls having a plurality of outlet ports for allowing said air and said smoke drawn through said air purifier means and expelled into said space to pass outwardly therethrough.

4,648,379

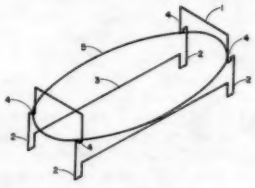
ROASTER FRAME OR RACK LIFTER

Donald E. Fordyce, 5337 Bastille, El Paso, Tex. 79924

Filed Dec. 10, 1985, Ser. No. 807,447

Int. Cl.[4] F24C *15/16*

U.S. Cl. 126—337 R **5 Claims**



1. A cooking rack adapted to fit within a roasting pan and hold a fowl or roast;

said rack comprises a main support frame and a removable oval containing member made of bent wire; said main frame is in a form which provides handles at opposed ends thereof, legs at the bottom thereof, and slots above the legs and below the handles;

said removable oval containing member is supported within said slots with said handles being received within said oval containing member; whereby:

a product to be cooked is placed on said main support frame and within said removable oval containing member, said removable oval containing member is received within said slots on said main support frame, so that the rack containing the product can be placed within a roasting pan where the product is supported free of the bottom of the pan.

4,648,380

HEATING APPARATUS USING LIQUEFIED GAS

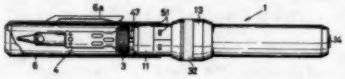
Masahiko Nakajima, Tokyo, Japan, assignor to Nakajima Ookosho Company Ltd., Tokyo, Japan

Filed Jul. 25, 1985, Ser. No. 758,804

Claims priority, application Japan, Jul. 31, 1984, 59-160320

Int. Cl.[4] B23K *3/02*

U.S. Cl. 126—414 **7 Claims**



1. A heating apparatus using liquefied gas comprising:

a control valve including,

means including a gas flow rate control member, rotatable around its longitudinal axis to control the rate of gas flow,

a cylindrical valve body having first and second ends, said first end being projected from said flow rate control member, said valve body discharging gas, said discharging gas being subject to control by said flow rate control means when said valve body is caused to slide toward said first end, said valve body interrupting the discharge of the gas when said valve body is caused to slide toward said second end, and

a spring attached to said valve body for urging said valve body resiliently toward said second end,

a gas reservoir for supplying gas to said control valve; means for generating a gas mixture including,

a restriction member for receiving and then jetting out the gas discharged from said first end of said valve body,

a gas mixture generating member having a gas aperture through which is introduced, the gas jetted out from said restriction member, and means defining an air introduction aperture perforated through the circumferential wall of said gas mixture generating member for introducing external air by the ejector effect of the gas jetted out from said restriction member and generating a gas mixture of the gas and the air in said gas mixture generating member;

a combustion section for the combustion of said gas mixture jetted out from said means for generating a gas mixture; and

a means for operating said control valve mounted to said control valve including,

an actuation member for causing said valve body to slide toward said first end of said valve body by movement toward said first end in combination with movement along the circumferential direction relative to said control valve, and causes said flow rate control means to rotate when said actuating member is rotated around the axis of said control valve, and said flow rate control means includes a second control member,

a connecting member for integrally connecting said actuating member with said second control member.

4,648,381

GAS COOKING OVEN

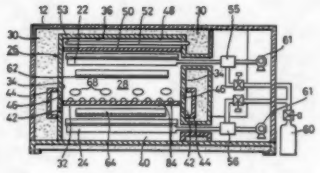
Toshio Ishii, 2324-4, Shirakuchi, Araki-machi, Kurume-shi, Fukuoka-ken; Yasuhisa Sakamoto, and Isao Takahashi, both of Fukuoka, all of Japan, assignors to Toshio Ishii, Kurume, Japan

Filed Feb. 1, 1985, Ser. No. 697,306

Claims priority, application Japan, Feb. 4, 1984, 59-19006; May 31, 1984, 59-81228[U]; Oct. 11, 1984, 59-214021; Dec. 10, 1984, 59-187511[U]

Int. Cl.[4] A21B *1/08*

U.S. Cl. 126—20 **11 Claims**



1. A gas cooling oven comprising an oven body supporting a substantially box-like oven liner and a frontopening access door which defines an oven cooking cavity, a baking plate for carrying thereon foods to be baked, the baking plate being removably placed in the oven liner to form the bottom wall of the cooking cavity, a fire box located beneath the baking plate, first gas burner means positioned in the fire box, steam generating means located in the top of the cooking cavity to generate and supply hot steam thereto, and second gas burner means located adjacent to the steam generating means, the steam generating means receiving the heat from the second gas burner means to generate the steam which flows into the cooking cavity and contacts the foods as it passes over the baking plate, thereby enabling the baking of the foods to have desired properties, said steam generating means comprising compartment means, water tube means located in the compartment means and having at least one water discharge nozzle provided therein, the water tube means being adapted to received therein a supply of water, and nozzle means provided in the compartment means for discharging the generated steam into the oven cooking cavity.

4,648,382

DEVICE FOR STEAM COOKING FOOD

Dale E. Greenbacker, Meriden, Conn., assignor to Daleco, Inc., Meriden, Conn.

Filed Jun. 13, 1983, Ser. No. 503,611

Int. Cl.[4] A47J *27/06*

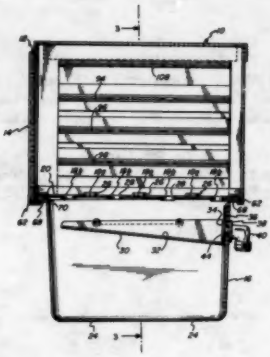
U.S. Cl. 126—348 **16 Claims**

1. A device for steam cooking food wherein energy for producing steam from a liquid is provided by a heat source, the device comprising:

a chamber for containing said food, said chamber having access means for insertion and removal of said food, said chamber including a floor having a plurality of vents therein;

a reservoir for containing said liquid heated by said heat source to produce steam, said reservoir being in fluid communication with said vents to transmit steam in one direction, said steam in said chamber producing a condensate containing contaminates from said food, said conden-

sate being transferred through at least one group of said vents;



said plurality of vents including a second group of vents having means for preventing drainage of condensate therethrough into the reservoir.

4,648,383

PERORAL APPARATUS FOR MORBID OBESITY TREATMENT

Jean P. Angelchik, 1728 W. Glendale Ave., Phoenix, Ariz. 85021

Continuation-in-part of Ser. No. 690,852, Jan. 11, 1985, Pat. No. 4,607,618, which is a division of Ser. No. 469,095, Feb. 23, 1983, abandoned. This application Jul. 22, 1985, Ser. No. 757,158

Int. Cl.[4] A61B *17/00*

U.S. Cl. 128—1 R **1 Claim**

1. Apparatus for peroral treatment of morbid obesity comprising a collapsible intra-gastric appliance, said appliance being a collapsible, hollow, shaped device which is

normally shaped and dimensioned to be received and retained within the fundus without deforming the stomach walls beyond its normal shape and dimensions,

formed of a semi-rigid skeleton which is collapsible by the application of external force to deform said device to a shape and cross-sectional dimension which is insertable into the stomach through the esophagus and the cardiac opening, and

capable of autogenously reassuming and retaining said normal shape when such collapsing external force is removed, said appliance also including

(a) means for detachable connection to the lower end of an elongate semi-rigid inserter rod, and

(b) means defining an aperture in said appliance through which said rod can be passed to effect such detachable connection.

4,648,384

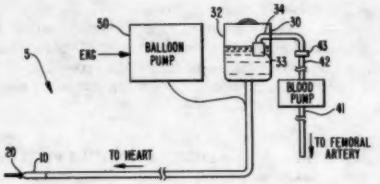
RETROGRADE CORONARY SINUS PERFUSION DEVICE AND METHOD

Robert E. Schmukler, 159-34 Riverside Dr. W., Apt. #4D, New York, N.Y. 10032

Filed Nov. 21, 1984, Ser. No. 673,793

Int. Cl.[4] A61B *19/00*

U.S. Cl. 128—1 D **20 Claims**



7. A retrograde coronary perfusion device for a patient comprising:

a multiple lumen catheter, a portion of which is to be inserted into the coronary sinus of said patient's heart, said catheter including first and second lumens and a tip end which is inserted into the coronary sinus;

a two-chambered balloon surrounding said multiple lumen catheter at a distance from said tip end approximately equal to the portion of said multiple lumen catheter to be inserted into the coronary sinus such that said balloon and the valve of said coronary sinus coincide when said catheter is properly inserted in said sinus, said multiple lumen catheter containing a flow path between said balloon and said first lumen so that gas in said first lumen may inflate said balloon;

a reservoir of blood coupled to a distal end of said second lumen of said multiple lumen catheter opposite to said tip end, said reservoir including means for providing a supply of blood into the coronary sinus from said second lumen at a relatively constant pressure, said blood supply providing means including

entrance means for allowing blood to enter said reservoir, and

a ball float valve positioned proximate said entrance means to keep the level of blood in said reservoir relatively constant by controlling the supply of blood to said reservoir; and

a balloon pump coupled to said first lumen to force gas into said first lumen at a rate synchronized with the pulse rate of said heart.

4,648,385

APPARATUS FOR DRIVING A MEDICAL APPLIANCE

Takeharu Oumi; Toshinobu Kageyama, both of Toyota, and Sadahiko Mushika, Tokyo, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Nov. 14, 1984, Ser. No. 671,384

Claims priority, application Japan, Nov. 14, 1983, 58-213748

Int. Cl.[4] A61B *19/00*

U.S. Cl. 128—1 D **16 Claims**

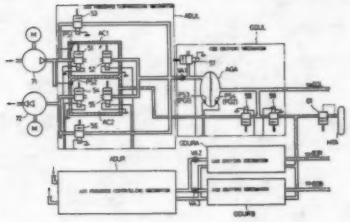
1. An apparatus for driving a medical appliance comprising:

setting means provided with a plurality of switches

a first pressure regulating device comprising a positive pressure source, a first solenoid valve having an input terminal connected to an output terminal of said positive pressure source, a negative pressure source, a second solenoid valve having an input terminal connected to an output terminal of said negative pressure source and an output terminal connected to an output terminal of said first solenoid valve, and first electronic control means for controllably opening and closing said first and second solenoid valves in accordance with the setting values

preset by said setting means, the output terminal of said first solenoid valve serving as an output terminal of said first pressure regulating device; and

a second pressure regulating device comprising medical appliance driving means having an input terminal and an output terminal separated by a diaphragm shiftable in a predetermined range in accordance with the applied pressure, first pressure detecting means disposed on at least the output side of said medical appliance driving means, gas supplying means, a third solenoid valve having an output terminal connected to the output side of said medical appliance driving means and an input terminal connected to an output terminal of said gas supplying means, and second electronic control means for controlling energization of said third solenoid valve in accordance with both the setting values preset by said setting means and an output signal from said first pressure detecting means, the input terminal of said medical appliance driving means being connected to the output terminal of said first pressure regulating device and the output terminal of said medical appliance driving means being connected to said medical appliance wherein said positive pressure source is



provided with a fourth solenoid valve inserted in a flow passage thereof and second pressure detecting means for detecting pressure at an output terminal of said fourth solenoid valve, said negative pressure source is provided with a fifth solenoid valve inserted in a flow passage thereof and third pressure detecting means for detecting pressure at an output terminal of said fifth solenoid valve, and said first electronic control means controls said fourth solenoid valve in accordance with both the positive pressure setting value preset by said setting means and an output signal from said second pressure detecting means, and also controls said fifth solenoid valve in accordance with the negative pressure setting value preset by said setting means and an output signal from said third pressure detecting means and wherein said first pressure regulating device includes a sixth solenoid valve connected between the output terminal of said first pressure regulating device and an input terminal of said fourth solenoid valve, and said first electronic control means controllably opens and closes said sixth solenoid valve at the given timing in synchronous relation with the control timing of said first solenoid valve.

4,648,386

LASER BRONCHOSCOPE VENTILATOR

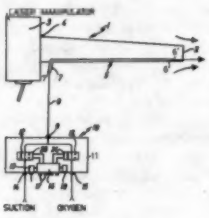
Graham N. Morritt, 16 Westfield Drive; Malvolio L. Paes, 18 Roseworth Crescent, both of Gosforth, Newcastle-on-Tyne, Tyne and Wear; Ian D. Conacher, 44 Moorside South, Fenham, Newcastle-on-Tyne, Tyne and Wear; John R. Gutridge, 20 Hertford Avenue, East Sheen, London SW14 8 EE, and Timothy R. Snellgrove, 4 Oakbank, Prestwich, Manchester, all of England

Filed Sep. 19, 1984, Ser. No. 652,061

Claims priority, application United Kingdom, Jan. 28, 1984, 8402313

Int. Cl.[4] A61B *1/26, 17/36*

U.S. Cl. 128—4 **6 Claims**



1. Laser bronchoscopy apparatus for use in performing bronchial surgical procedures on a patient comprising:

a tubular bronchoscope instrument including a body portion having a forward end and a rear end;

a laser manipulator secured to and blocking said rear end of said instrument;

a gas passage (means) tube of relatively small cross section extending along the body portion of said instrument for a major portion of its length and having an outlet port in the region of said forward end of said instrument and an input port in the region of said rear end of said instrument, said tube extending along a side surface of the body portion so as to leave said body portion free for direction of said laser manipulator therealong;

a ventilation system, including first and second control valves, connected to said input port, said ventilation system further being respectively connected from a pressurized source of gas and a source of reduced pressure or suction to said input port by said first and second control values;

control means having first and second operational modes for controlling the opening and closing of said first and second valves and being switchable between a first or ventilation mode and a second or suction mode;

said ventilation mode effecting alternate opening and closing of said first valve while maintaining said second valve closed to cause pressurized gas to flow intermittently along said gas passage tube from said input port to said outlet port for ventilating said patient, and said suction mode effecting opening of said second valve while maintaining said first valve closed to cause suction to be applied to said gas passage tube from said input port to said outlet port for removing smoke while surgical procedures are performed with said laser manipulator on said patient;

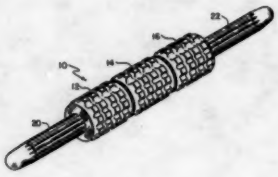
said control means being further operable to switch automatically from said first mode to said second mode after a predetermined number of cycles of alternate opening and closing of said first valve and to switch automatically from said second mode to said first mode after a predetermined period of time in said second mode.

4,648,387

MASSAGE IMPLEMENT

Lois M. Simmons, 8904 Nelson Way, Escondido, Calif. 92026

Filed Jun. 3, 1985, Ser. No. 740,582
Int. Cl.[4] A61H 15/00; A63B 23/04
U.S. Cl. 128—57 5 Claims



1. A massage implement comprising:

a first and a second elongated generally cylindrical handle, each having a proximal end and a distal end;

said distal end having a semi-spherical tip to provide a pressure surface for application of massaging pressure to selected areas of the body;

each of said handles including a portion of uniform diameter between said proximal end and said tip, the outer surface of said handle portion having a plurality of circumferentially spaced, longitudinally extending flutes to provide a gripping surface on said handle both during the rolling application of said rollers to the body and during said application of massaging pressure to selected areas of the body with said tip;

an elongated cylindrical shaft having a first end and a second end and secured at said first end co-axially to said proximal end of said first handle and extending co-axially therefrom and connected at said second end to said proximal end of said second handle; and

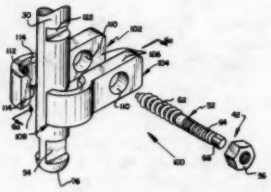
a plurality of generally cylindrical rollers rotatably mounted on said shaft, each said rollers having a plurality of first grooves extending along the surface of said roller parallel to the axis thereof, and a plurality of second grooves extending around the circumference of said roller for defining a plurality of pressure pads, each having a generally rectangular pressure surface extending radially outward from the outer surface of said roller and disposed in a plurality of circumferential rows around said roller.

4,648,388

APPARATUS AND METHOD FOR MAINTAINING VERTEBRAE IN A DESIRED RELATIONSHIP

Arthur D. Steffee, Moreland Hills, Ohio, assignor to AcroMed Corporation, Cleveland, Ohio

Filed Nov. 1, 1985, Ser. No. 793,901
Int. Cl.[4] A61F 5/00; A61B 17/18
U.S. Cl. 128—69 8 Claims



1. An apparatus for maintaining vertebrae in a desired relationship, said apparatus comprising:

a rod, said rod being deformable to a configuration which is a function of a desired curvature of a spine, said rod having a sufficient length and rigidity to maintain at least three adjacent vertebra in the desired relationship;

clamp means for gripping a portion of said rod, said clamp means having a clamp portion which includes inner surfaces which circumscribe said rod, said clamp means also having a base portion projecting outwardly from one side of said clamp portion, said base portion includes surface means defining an opening which is offset to one side of said rod; and

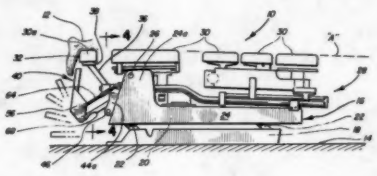
fastener means for securing said clamp means to a vertebra and for pressing said inner surfaces of said clamp means against an outer side surface of said rod to hold said rod against axial and rotational movement relative to said clamp means, said fastener means including an externally threaded member extending through the opening in said base portion and having a central axis extending transversely to a central axis of said rod, said externally threaded member including first thread means for engaging a vertebra disposed on a first side of said clamp means, second thread means extending outwardly of a second side of said clamp means, and internally threaded means for engaging said second thread means and applying force against said clamp means to press said clamp means against the vertebra engaged by said first thread means.

4,648,389

PATIENT TREATMENT TABLE

Frank P. Kowalski, Des Plaines, and Gerald R. Scott, Elmhurst, both of Ill., assignors to Standex International Corporation, Salem, N.H.

Filed May 31, 1985, Ser. No. 739,988
Int. Cl.[4] A61F 5/00
U.S. Cl. 128—70 15 Claims



1. A patient treatment table, comprising:

base means adapted to be supported from a floor surface;

patient supporting table means having a patient support surface and a foot end surface, said table means mounted for pivotal movement relative to said base means between a generally horizontal position for patient treatment wherein said patient support surface is generally horizontal and a generally upstanding position wherein said patient support surface is extended upwardly for enabling a patient to mount and dismount more easily;

footboard means adjacent a foot end of said table means and having a foot support surface, an underside parallel thereof and an outer end, said footboard means mounted for movement between a generally horizontal position wherein said underside is near said floor surface and said outer end is projecting outwardly of an extension of said patient support surface of said table means for supporting a patient when said table means is in said upstanding position and a second position wherein said outer end of said footboard means is spaced beneath said foot end surface of said table means whensaid table means is in said horizontal position and wherein said underside of said footboard means is spaced inwardly toward said base means from the feet of a patient lying on said table means to provide unobstructed exposure of said patient's feet for treatment by a person standing on said floor surface outwardly of said foot end of said table means; and

linkage means interconnecting said table means and said footboard means for moving said footboard means be-

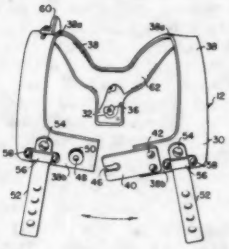
tween said first and second positions as said table means is pivoted relative to said base means.

4,648,390

LOW PROFILE NECK RING ORTHOSIS

Frank E. Friddle, P.O. Box AR, Rte. 2, Honea Path, S.C. 29654

Filed May 17, 1985, Ser. No. 735,376
Int. Cl.[4] A61F *5/04, 5/01*
U.S. Cl. 128—78 9 Claims



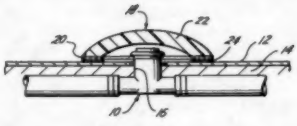
1. An improved low profile neck ring for attachment to supporting structure of an orthopedic body brace employed to treat curvature of the spine comprising a resiliently deformable unitary collar plate for closely surrounding the lower neck portion of a wearer, said plate being a single unit having a anterior yoke portion for overlying the sternum of the wearer and having a pair of elongated web portions having a lateral width substantially greater than the thickness of the plate, said web portions initially extending upwardly and rearwardly from the yoke portion to overlie the clavicle areas on either side of the neck of the wearer, then extending over the shoulders and terminating in posteriorly located end portions, said end portions in abutting relation to overlie the area of the spine adjacent the scapula of the wearer, releasable fastening means rigidly interconnecting the abutting end portions of the web portions of the collar plate to prevent their relative movement, means on said yoke portion of the plate for rigidly attaching the collar plate to an upstanding support bar of a body brace, and means for attaching each posterior end portion of each web portion of the collar plate rigidly to an upstanding support bar of a body brace.

4,648,391

STABILIZER FOR PERCUTANEOUS MEDICAL DEVICES

Willard H. Ellis, Round Rock, Tex., assignor to Carbomedics, Inc., Austin, Tex.

Filed Nov. 18, 1985, Ser. No. 798,936
Int. Cl.[4] A61F *15/00*
U.S. Cl. 128—132 R 13 Claims



1. A protective stabilizer cap for use with a percutaneous device comprising,

(a) substantially inflexible cap means having a surface adapted peripherally for cutaneous contact in juxtaposition with the percutaneous device, and

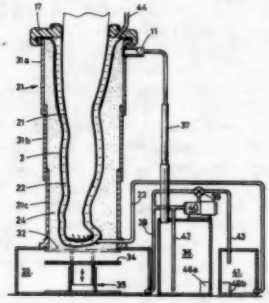
(b) adhesive means for removably affixing the cap means (a) to skin about the percutaneous device so that relative motion as between the percutaneous device and the skin is restricted.

4,648,392

APPARATUS FOR THE TREATMENT OF OEDEMA OF MEMBERS BY PRESSURE

Claude J. Cartier, Chateauroux; Jean R. R. Guilhem, Le Havre; Jacques R. J. Guilhem, Sainte Adresse, and Roger L. L. Wenger, Le Havre, all of France, assignors to Societe Generale d'Etudes et de Materiels Industriels Navals et Informatiques, France

Filed Nov. 5, 1985, Ser. No. 795,191
Claims priority, application France, Nov. 6, 1984, 84 16869
Int. Cl.[4] A61F *5/40*
U.S. Cl. 128—160 21 Claims



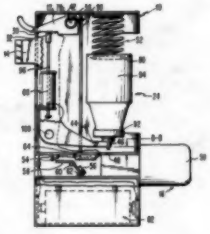
1. An apparatus for treating oedema of members of the body, comprising a vertical cylindrical vessel, a flexible tubular outer bag located in the vessel and having a closed end and an opposite opened end, means for fixing a periphery of said open end to a periphery of an upper part of the vessel, an inner flexible bag having a closed end and disposed coaxially inside the outer bag, the bags defining therebetween a small closed space, and means for introducing a liquid of high density in said space, and means for achieving in the vessel and around the outer bag a solid molding, which is capable of being disaggregated, of a member of any size introduced in the inner bag.

4,648,393

BREATH ACTIVATED MEDICATION SPRAY

Robert Landis, New York, N.Y., and Joseph E. Kassay, Lawrence Harbor, N.J., assignors to Ackrad Laboratories, Inc., Cranford, N.J.

Filed Nov. 2, 1984, Ser. No. 667,544
Int. Cl.[4] A61M *15/00*
U.S. Cl. 128—200.23 15 Claims



1. An inhalation device for dispensing a medicament to a patient from a metered dosage cartridge, comprising:

a housing adapted to be held by hand;

said housing having a mouthpiece and a connecting passageway communicating with said mouthpiece for ambient air to be inhaled by said patient;

triggering means supported by said housing, said housing including recess means for receiving said metered dosage cartridge between said triggering means and said housing, said triggering means being movable to a first position for moving said cartridge to a non-operative position and to a second position for permitting said cartridge to move to an operative position;

biasing means in said housing for biasing said cartridge against said triggering means and for moving the cartridge to said operating position upon activation of said triggering means; and

battery powered circuit means positioned in said housing including switch means positioned in association with said passageway and solenoid means secured to said housing for activating said triggering means;

the cartridge including pin means communicating with said passageway for releasing said medicament from the cartridge to said passageway upon activation of said triggering means;

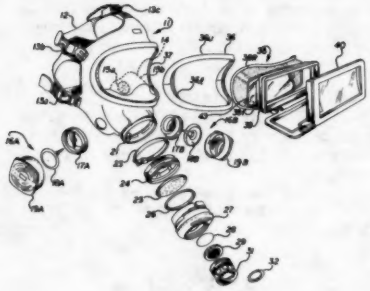
said switch means being for closing said circuit and thus activating said solenoid means and thereupon activating said triggering means from said first to said second position thereby causing said biasing means to move said cartridge to said operating position thus dispensing a metered amount of said dosage into said passageway from the cartridge, said switch means being activated by a decrease in pressure in said passageway generated by the inhaling action of said patient.

4,648,394

FACEMASK FOR ABRASIVE SERVICE

Layton A. Wise, Washington, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Jun. 12, 1985, Ser. No. 743,785
Int. Cl.[4] A62B *7/00*
U.S. Cl. 128—201.24 **5 Claims**



3. A protective face mask adapted for use with a respirator comprising:

(a) a mask body adapted to cover a face of a user and having a viewing portal with a permanent lens sealingly mounted in and covering said viewing portal;

(b) a lens cartridge retainer having a pair of overlapping adjacent panels one of which is sealingly secured to said lens, said panels provided with a single hinged connection therebetween along one of their peripheral edges and defining, when in their overlapping positions, inner surfaces providing an inner chamber, said other of said panels adapted for manual release to provide access from outside of the mask to said chamber defined by said retainer and,

(c) a lens cartridge assembly complementally configured to said chamber and removably disposed therein, said cartridge comprising

(i) on open deformable frame made of a resilient elastomeric material with the outer periphery of the frame complementally configured to sealingly engage the inner surfaces of the chamber, said frame also defining an inner peripheral surface;

(ii) at least two disposable lenses positioned so that the planar faces of the lens are layered one upon the other and secured in said frame around the outer peripheral edges of the lenses to the inner peripheral surface of the frame and which disposable lenses can be removed only from outside of the mask; and

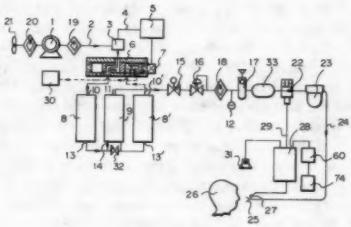
(iii) further wherein, each of said disposable lenses has at least one end tape bonded to the planar surface of each disposable lens where said planar surface faces outward from the face of the user so that the user may grasp the end tape from outside of the mask to facilitate removal of the lens.

4,648,395

SYNCHRONIZED FEED TYPE OXYGEN CONCENTRATOR FOR USE IN AN OPEN BREATHING SYSTEM

Toru Sato, Tottori, and Kozo Moriya, Shiga, both of Japan, assignors to Sanyo Denshkogyo Co. Ltd., Okayama, Japan

Continuation-in-part of Ser. No. 511,194, Jul. 6, 1983, abandoned. This application Aug. 13, 1984, Ser. No. 640,086
Claims priority, application Japan, Jul. 7, 1982, 57-118063
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—204.23 **11 Claims**



1. In an open breathing circuit including a gas supply system and a breathing system of a human being or the like, said gas supply system supplying oxygen enriched gas produced from ambient air to said breathing system in synchronization with a breathing motion of said human being or the like through an open air type breathing system, comprising:

synchronized feed type oxygen concentration means for supplying oxygen enriched gas to said breathing system in synchronization with said breathing motion of said human being or the like, including:

thermocouple sensor means adapted to be positioned close to the nostrils of said human being or the like for generating an detection signal indicative of the instantaneous temperature of a breathing air flow of said human being or the like; and

control means, coupled to said thermocouple sensor means, for detecting the beginning of an inhalation phase in a breathing cycle of said human being or the like by detecting substantially the beginning of a drop in temperature indicated by said detection signal, and for controlling said gas supply system so as to supply oxygen enriched gas to said breathing system only during said inhalation phase, said control means including:

amplifier circuit means, coupled to an output of said thermocouple sensor means, for amplifying a voltage level of said detection signal to a desired level;

holding means, coupled to an output of said amplifier

circuit means, for holding a first voltage level of the amplified detection signal from said amplifier circuit means, said first voltage level being the voltage level of an output of said amplifier circuit means at a given moment;

comparator means, coupled to an output of said amplifier circuit means and to an output of said holding means, for comparing a second voltage level of said amplified detection signal with said first voltage level, said second voltage level being the voltage level of said amplifier circuit means at the moment when a predetermined period of time has passed since said first voltage level started to be held, and for generating an enabling pulse beginning the supply of gas when the absolute value of said second voltage level is less than the absolute value of said first voltage level, said first voltage level absolute value being arranged to be less than the absolute value of a predetermined portion of the maximum absolute value of said detection signal voltage level; and

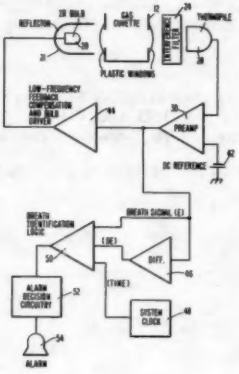
bistable means coupled to an output of said comparator means and being switched by said enabling pulse to a first state for commencing said supply of gas, and being switched to a second state for halting said supply of gas, thereby continuing to supply said gas for the duration of said inhalation phase.

4,648,396

RESPIRATION DETECTOR

Daniel B. Raemer, Brookline, Mass., assignor to Brigham and Women's Hospital, Boston, Mass.

Filed May 3, 1985, Ser. No. 730,158
Int. Cl.[4] A62B *7/00*
U.S. Cl. 128—204.22 **20 Claims**



1. An apparatus for monitoring respiration, comprising:

means for monitoring the carbon dioxide content of a patient's expired gas stream and for monitoring the carbon dioxide content of the patient's inspired gas stream; and

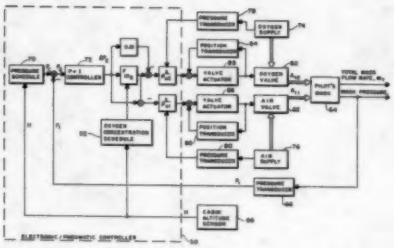
means responsive to said means for monitoring for generating an alarm signal whenever the carbon dioxide content of the expired stream does not exceed the carbon dioxide content of the inspired gas stream by a predetermined amount, whereby calibration of said apparatus for an absolute value of carbon dioxide in either of said streams is avoided.

4,648,397

ELECTRONICALLY COMPENSATED PRESSURE DILUTION DEMAND REGULATOR

Robert B. Beale, Arden Hills, Minn., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 28, 1985, Ser. No. 791,959
Int. Cl.[4] A62B *7/00*
U.S. Cl. 128—205.11 **8 Claims**



1. A pressure demand dilution regulator for regulating a fluid mixing apparatus which supplies a breathable fluid in response to changes in the physiological breathing needs of a recipient, said regulator comprising:

an oxygen inlet adapted to be connected to an oxygen source and an air inlet adapted to be connected to an air source;

an oxygen flow control means connected to said oxygen inlet for adjusting oxygen flow from said oxygen source;

an air flow control means connected to said air inlet for adjusting air flow from said air source;

inhalation means connected to said oxygen inlet and said air inlet;

sensor means for generating a signal representative of suction pressure in said inhalation means caused by the recipient's breathing gas supplied through said oxygen and air flow control means;

means for sensing altitude;

means coupled to said altitude sensing means for generating signals corresponding to a prescribed pressure and oxygen concentration percentage based on altitude;

means for comparing said sensed signal representative of suction pressure with said prescribed pressure signal to develop an error signal; and

means coupled to said oxygen concentration generating means for proportionally biasing said error signal between said oxygen flow control means and said air flow control means according to said prescribed oxygen concentration percentage.

4,648,398

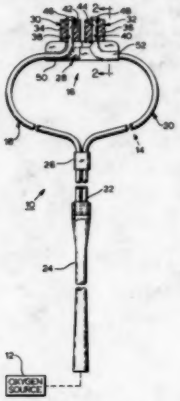
NASAL CANNULA

Ronald T. Agdanowski, St. Peters; James A. Geil, St. John, and Bernard J. Tatro, Manchester, all of Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Oct. 31, 1984, Ser. No. 666,847
Int. Cl.[4] A61U *15/08*
U.S. Cl. 128—207.18 **1 Claim**

1. A nasal cannula comprising a pair of nasal tips, a bridge connecting said tips together for respective insertion into the nostrils of a patient, each of said tips including a resilient, compressible foam seal, and gas flow passage means extending therethrough for connection with a source of gas, each of said foam seals having a rate of recovery from 60% compression thereof to 40% compression thereof in a time range between about 1 and 60 seconds, said seals having a size adapted to be manually compressed and respectively insertable into the nostrils of the patient and expandable thereafter to obturate the nostrils about said passage means, said passage means including

a pair of conduits respectively extending through said seals and connectable to a source of gas, said pair of conduits respectively including a pair of gas supply tubes extending through



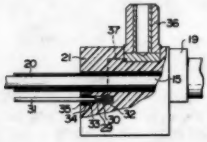
said bridge, each of said conduits including an annular radial flange at the distal end thereof, and each of said seals is disposed between the flange of its respective conduit and said bridge.

4,648,399

RESECTOSCOPE

Akio Nakada, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Dec. 24, 1984, Ser. No. 685,314
Claims priority, application Japan, Jan. 9, 1984, 59-1044[U]
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.14 **3 Claims**



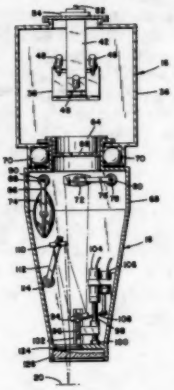
1. A resectoscope for resecting an object, comprising:
a longitudinally elongate resectoscope body;
a sheath portion for insertion into the object to be resected;
a slider including an electrode hole and an electrical terminal fixed in said electrode hole;
means for mounting the slider for longitudinal movement with respect to said sheath portion; said means spacing said slider from a proximal end of said sheath portion;
an electrode having a proximal end which is secured within said electrical hole and a distal end and a resecting element located at said distal end, the resecting element being for resecting an affected part of the object upon application of an appropriate current to said electrode; and
an elastic seal means disposed in an inlet of said electrode hole abutting said electrode for elastically sealing said hole so as to make said hole water tight and prevent fluid spray droplets induced by passing high frequency current through said electrode from creating an electrical short between a noninsulated portion of said electrode within said electrode hole and a further noninsulated portion of the resectoscope.

4,648,400

OPHTHALMIC SURGERY SYSTEM

Richard T. Schneider, Gainesville, Fla., and Richard H. Keates, Columbus, Ohio, assignors to RTS Laboratories, Inc., Gainesville, Fla.

Filed May 6, 1985, Ser. No. 731,121
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 **27 Claims**



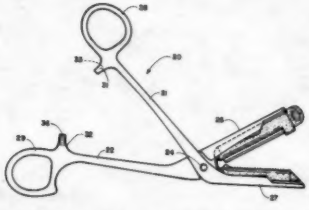
1. Apparatus for performing corneal surgery on an eye, comprising:
means for generating a pulsed light beam in the ultraviolet/-vacuum ultraviolet region;
means for shaping, focusing, and directing the beam toward the eye;
means for counting the number of pulses of light generated; and
means covering the eye and responsive to said counting means for selectively exposing predetermined portions of the cornea to the beam for a predetermined number of pulses sufficient to effect cutting of the cornea to the desired depth.

4,648,401

SURGICAL INSTRUMENT FOR SEVERING AN UMBILICAL CORD

Philip D. Mattson, 1776 Plantation Way, San Diego, Calif. 92020

Filed Oct. 29, 1984, Ser. No. 665,723
Int. Cl.[4] A61B *17/12*
U.S. Cl. 128—305 **11 Claims**



1. A scissor-like surgical instrument including handle portions and first and second closing jaw portions attached thereto for simultaneously severing an umbilical cord, compressing the placental end of the cord, and applying an umbilical clamp about a section of the cord, said instrument comprising:
a first hemostat surface unreleasably affixed to said first jaw;
a second hemostat surface unreleasably affixed to said second jaw, said hemostat surfaces adapted to compress the umbilical cord therebetween upon closure of said jaws and to release the cord upon opening of said jaws;

cutting means disposed upon one of said jaws for severing the umbilical cord upon closure of said jaws; and

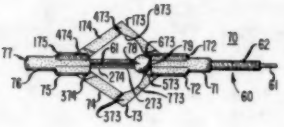
coupling means on at least one of said jaws for releasably coupling with corresponding coupling means on the umbilical clamp.

4,648,402

BLOOD VESSEL DILATING SURGICAL INSTRUMENT

Manuel V. Santos, 126 Pulaski St., Newark, N.J. 07105

Filed Oct. 3, 1985, Ser. No. 783,652
Int. Cl.[4] A61B *17/22*; A61M *29/00*
U.S. Cl. 128—345 **7 Claims**



1. A surgical instrument for dilating a blood vessel or the like, said instrument comprising:

a rear manually operated control mechanism further comprising: a stationary member and a movable member being movable longitudinally relative to said stationary member;

an intermediate hollow cable-wire structure combination including a hollow cable and a flexible wire running therethrough, the rear end of said cable being connected to the front end of said stationary member and the rear end of said wire being connected to the front end of said movable member, said wire being located and being longitudinally movable within said cable in response to the motion of said movable member;

and a front multilinkage mechanism further comprising: a rear stationary hollow cylindrical section including a plurality of longitudinal ribs, a longitudinal central hole, and having the front end of said cable being connected to the rear end thereof; a similar plurality of rear linkages being in alignment with said rear ribs, the rear ends of said rear linkages being rotatable relative to the front ends of said rear ribs, and said rear ribs further including internal edges; a similar plurality of front linkages being in alignment with said rear linkages and having their rear ends being rotatable relative to the front ends of said rear linkages; and a front movable cylindrical section including a similar plurality of longitudinal ribs and a longitudinal central hole; said wire being located within the longitudinal central hole of said rear stationary section and being located within the longitudinal central hole of said front movable section; said front multilinkage mechanism also further comprising means being fixedly attached to said wire in between said rear stationary section and said front movable section for applying a force to the internal edges of said rear linkages to cause opening of said front multilinkage mechanism in response to the rearward motion of said wire for dilating said blood vessel.

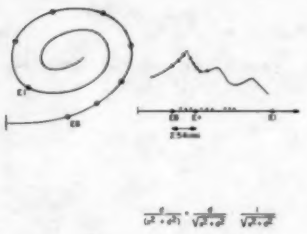
4,648,403

METHOD AND APPARATUS FOR PROVIDING SPREAD CORRECTION IN A MULTI-CHANNEL COCHLEAR PROSTHESIS

Dirk S. Van Compernolle, Palo Alto, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed May 16, 1985, Ser. No. 734,500
Int. Cl.[4] A61N *1/30*
U.S. Cl. 128—419 R **7 Claims**

1. A method for accurately stimulating the auditory nerves to a human comprising the steps of extending a cochlear prosthesis including a plurality of electrodes along a region where said nerves are tonotopically organized to detect both high and low frequencies, utilizing a speech processor to develop a desired set of stimulating currents for said nerves, and modifying said set of stimulating currents by an inverse convolution prior to their application to said cochlear prosthesis electrodes, whereby effects of current spreading are taken into account.

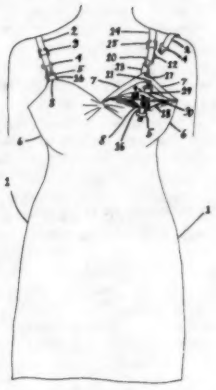


4,648,404

COORDINATED NURSING SLIP AND BRA

Susan A. Clark, 128 Hopeland La., Sterling, Va. 22170

Filed Dec. 9, 1983, Ser. No. 559,663
Int. Cl.[4] A41C *3/08*
U.S. Cl. 128—455 **15 Claims**



1. A coordinated nursing slip, for breast feeding an infant while wearing a subjacent coordinated nursing bra having features that are harmoniously complementary to said slip, in order to allow

(a) convenient and decorous simultaneous opening of the bosom of the slip and the nursing flap of the bra as a unit, and

(b) support of the opened slip by the bra, and

(c) handy retention of the opened slip shoulder strap front end, so as to prevent it from becoming inadvertently lost during nursing, and

(d) easy reclosure of the unitary slip bosom and nursing flap, comprising:

a slip with

openable strap fastening mens for attaching the front end of each shoulder strap of said slip to the corresponding apex of the bosom of said slip or to a bra retaining location, and

second fastening means for attaching the inside of said bosom just below each apex of said bosom to the outside

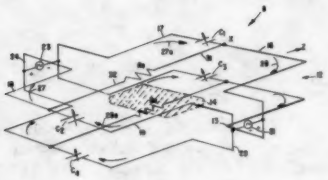
of the corresponding nursing flap of said subjacent bra just below the closure clasp of said flap.

4,648,405

BODY PROBES

Hannan Keren, Kfar Saba, Israel, assignor to Elscint, Ltd., Haifa, Israel

Filed Apr. 30, 1985, Ser. No. 728,871
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—653 **9 Claims**



1. An improved probe for magnetic resonance (MR) data acquisition systems, said probe comprising:

(a) first and second coil means adapted to be located at opposite sides of a sample, said coil means positioned to transmit radio frequency (Rf) pulses to nutate nuclei in said sample that were aligned by a main magnetic field and/or to receive free induction decay (FID) signals generated as the nutated nuclei realign;

(b) means for connecting said first and second coil means to a source of pulses of Rf potential to drive current through said first and second coil means;

(c) said means for connecting said first and second coil means to said source of pulses of Rf potential comprising two pair of first and second terminals for coil means, said first and second terminals connected to opposite sides of each of said coil means, each of said pair of terminals being of opposite instantaneous polarity to cause current to flow in the same direction through each of said coil means; and

(d) resistance means attached between first and second points, said first and point being equidistance from said first terminals of each of said two pair of terminals and said second point being equidistant from said second terminals of each of said two pair of terminals to theoretically be at the same potential, causing current to flow through said resistance means responsive to impedance imbalances thereby reducing effects of impedance imbalances in said first and second coil means.

4,648,406

PHYSIOLOGICAL PRESSURE MEASURING SYSTEM

William Miller, Westport, Conn., assignor to Michael Ebert, Mamaroneck, N.Y.

Filed Feb. 2, 1981, Ser. No. 230,640
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—674 **6 Claims**

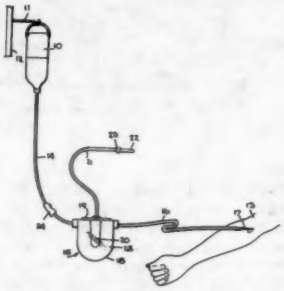
1. A physiological pressure measuring system comprising:

(A) an intravascular infusion set having a line carrying fluid to a patient whose pressure is to be monitored:

(B) a detector having a transparent chamber interposed in the line whereby the fluid carried to the patient flows through the chamber, and a flexible bulb mounted in the chamber, the exterior of the bulb being subjected to the pressure of the fluid in the chamber, the interior of the bulb communicating with a flexible pipe terminating in a hollow detector plug initially vented to the atmosphere whereby the bulb is collapsed when the chamber fluid pressure is greater than atmospheric;

(C) a transducer producing an analog signal as a function of applied pressure; and

(D) an input port coupled to said transducer to apply pressure thereto, said input port being defined by a tubular transducer jack adapted to telescopically receive and seal from the atmosphere said hollow detector plug which is axially advanceable into said transducer jack such that when a pressure reading is to be taken, an operator then inserts and axially advances the detector plug into said transducer jack to create in said pipe an air column whose effective length is determined by the length of the pipe and the variable length of the telescoping plug and jack and which is closed by the collapsed bulb to entrap the air therein, the effective length of the air column therefore depending on the axial position of the detector plug so that as the detector plug is advanced by the operator into the



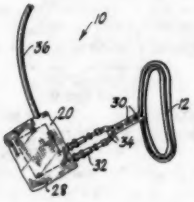
transducer jack to shorten the column, the entrapped air then is compressed to exert a pressure on the transducer, the parameters of the pipe and the telescoping plug and jack relative to the full range of pressures encountered in patients being such that a point is reached in the course of said advance where the air pressure in the column matches the pressure of fluid in the chamber, beyond which point further advance of the detector plug results in partial dilation of the collapsed bulb to relieve any increase in the column air pressure whereby the matching column pressure sensed by the transducer is maintained to provide the desired pressure reading.

4,648,407

METHOD FOR DETECTING AND DIFFERENTIATING CENTRAL AND OBSTRUCTIVE APNEAS IN NEWBORNS

Marvin A. Sackner, Miami Beach, Fla., assignor to Respitrace Corporation, Ardsley, N.Y.

Continuation of Ser. No. 752,499, Jul. 8, 1985, abandoned, which is a continuation of Ser. No. 553,239, Nov. 18, 1983, abandoned.
This application Jun. 13, 1986, Ser. No. 874,808
Int. Cl.[4] A61B 5/08
U.S. Cl. 128—721 **22 Claims**



1. A method of detecting and differentiating between central and obstructive apneas in a newborn subject, comprising:

mounting an external means for detecting movement across at least two adjacently-proximate cranial bones of the subject to detect relative movement between said bones;

generating a first signal indicative of changes in the relative

positions of said cranial bones detected by said means, changes in said first signal being indicative of changes in intrapleural pressure of the subject;

disposing a means for non-invasively detecting variations in tidal breathing at the subject's nostrils;

generating a second signal indicative of variations in tidal breathing detected by said last mentioned means, changes in said second signal being indicative of variations in nasal tidal volume of the subject; and

continuously monitoring said first and second signals to detect the presence of and to differentiate between central and obstructive apneas in the subject, whereby a substantial absence of changes in both said first and second signals is indicative of the presence of central apnea, and a substantial absence of changes in said second signal when accompanied by continuing changes in said first signal is indicative of the presence of obstructive apnea.

4,648,408

BLOOD SAMPLING UNIT

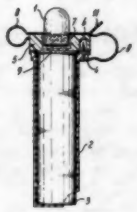
David W. Hutcheson, Grootebroek; Engelbertus J. Van Der Molen, Middenbeemster, and Pieter J. Oly, Wormer, all of Netherlands, assignors to Medscan B.V., Purmerend, Netherlands

Filed May 7, 1985, Ser. No. 731,680

Claims priority, application Netherlands, May 11, 1984, 8401536

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—770 12 Claims



1. A disposable blood sampling unit comprising three blocks connected to each other by hinged portions for movement between an open, operative position and a closed, storage position, one of said blocks carrying a lancet for pricking the skin of a user for draining a blood sample, another of said blocks defining a cavity for receiving said lancet when said blocks are in their closed storage position to protect said lancet, one of said blocks defining a recess for receipt of a disinfectant, and one of said blocks having means for accepting a blood sample from a user.

4,648,409

PAPER WEB FEED DEVICE IN A CIGARETTE PRODUCTION MACHINE

Riccardo Mattei, Bologna, Italy, assignor to G.D Societa per Azioni, Bologna, Italy

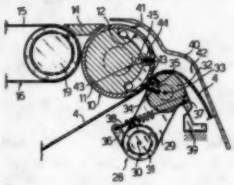
Filed Dec. 26, 1985, Ser. No. 813,680

Claims priority, application Italy, Jan. 16, 1985, 3307 A/85

Int. Cl.[4] A24C *5/14, 5/08*

U.S. Cl. 131—60 7 Claims

1. A paper web feed device in a cigarette production machine, comprising a suction roller (10) for advancing at least one paper web (4) along a first path, a loading station (23) disposed along said first path downstream of said suction roller (10) in order to feed a continuous stream (24) of shredded tobacco onto said web (4), and a conveyor (16) disposed along said first path for guiding said web (4) through said loading station 23, characterised by further comprising selectively operable deviator means (43) for separating said web (4) from a portion of the periphery of said suction roller (10) and deviating it along a second path, and removal means (28) cooperating



selectively with said suction roller (10) in order to detach and remove the portion of said web (4) fed along said second path.

4,648,410

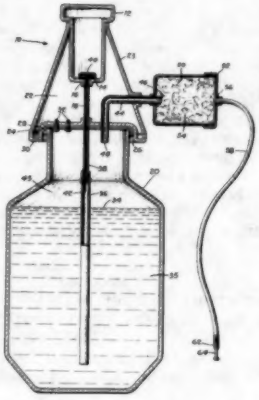
NARGILE - ORIENTAL TOBACCO WATER PIPE FOR SMOKING CURED TOBACCOS

Henry I. Seroussi, P.O. Box 269, Staten Island, N.Y. 10314

Filed Aug. 22, 1985, Ser. No. 756,590

Int. Cl.[4] A24F *1/30*

U.S. Cl. 131—173 15 Claims



1. A smoking apparatus for smoking cured tobacco, comprising:

an appliance to serve as a smoking pipe with a pipe bowl connected to a first tubular passage communicating with and extending from the lowest portion at the bottom of said pipe bowl;

means for releasably securing said appliance, serving as a smoking pipe, to a water receptacle having an air space above the liquid level, said first tubular passage extending from said pipe bowl in the direction of said receptacle wherein said means for releasably securing said appliance to said receptacle comprises a hollow, truncated cone, said pipe bowl inserted into the truncated end of said cone and said liquid-containing receptacle releasably secured at the base of said cone;

a tubular extension frictionally attached to the end of said first tubular passage opposite said pipe bowl, said tubular extension extending into said receptacle below the level of the water;

a filter element fluidly communicating with said air space above said liquid level by means of a second tubular passage attached to said filter element, said filter element containing a filter means for removing moisture;

the second tubular passage rising vertically from said air-

space is inverted outwardly in the direction of the said filter element; and

a third tubular passage attached to said filter at a location opposite that of said second tubular passage.

4,648,411

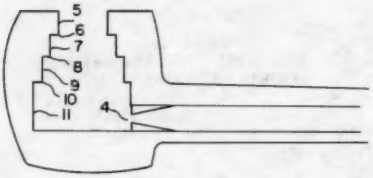
TOBACCO PIPE BOWL WITH ASSOCIATED HONING TOOL

Ronald D. Planesi, 5930 Clover Manor Way, Sacramento, Calif. 95824

Filed Oct. 25, 1983, Ser. No. 545,209

Int. Cl.[4] A24F *5/00, 9/10*

U.S. Cl. 131—226 **3 Claims**



2. A tobacco pipe including a pipe stem; a bowl having a furnace chamber therein; said furnace chamber having a central vertical axis; an opening at the top of said bowl for the insertion of said tobacco into said furnace; said furnace having a flat furnace floor located at the bottom of said furnace; a draw hole laterally positioned on an edge of said flat furnace floor so as to provide fluid communication between said furnace chamber and said pipe stem; said furnace having a plurality of distinct furnace areas arranged along the central vertical axis of said furnace wherein said distinct areas get larger in a step wise manner as you travel down the vertical axis from said top to said floor and the outer perimeter of said furnace areas are substantially parallel to said central vertical axis.

4,648,412

APPARATUS FOR PERFORATING WRAPPING MATERIAL FOR ROD-SHAPED ARTICLES OF THE TOBACCO PROCESSING INDUSTRY

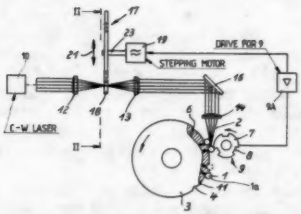
Uwe Heitmann, Hamburg, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Apr. 17, 1985, Ser. No. 724,198

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1984, 3414645

Int. Cl.[4] A24C *5/20*; A24D *3/02*

U.S. Cl. 131—281 **27 Claims**



1. Apparatus for perforating the wrapping material for rod-shaped articles of the tobacco processing industry so as to provide such material with zones of selected air permeability, comprising a source of coherent radiation arranged to direct at least one beam of such radiation along a predetermined path; means for moving the wrapping material along a second path which intersects said predetermined path; and means for intermittently interrupting the impingement of the beam upon the wrapping material intermediate said source of coherent radiation and the wrapping material in said second path so that the wrapping material in said second path is subjected to intermittent perforating action of the beam of coherent radiation.

4,648,413

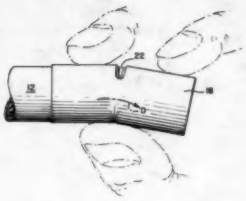
ADJUSTABLE-DELIVERY CIGARETTE

Barry L. Saintsing, Rte. 8, Box 399, Lexington, N.C. 27292; Douglas C. Clark, 5120 Angelia Dr., Winston-Salem, N.C. 27106, and John D. Weber, 6878 Brechenridge La., Clemmons, N.C. 27012

Filed Mar. 7, 1984, Ser. No. 587,325

Int. Cl.[4] A24D *3/04*

U.S. Cl. 131—336 **8 Claims**



1. An adjustable-delivery cigarette having:

a tobacco rod;

a filter element, abutting said tobacco rod, having an outer layer relatively impervious to airflow; and

an overwrap encircling said filter element, having formed therein a means for adjusting said delivery, said means comprising an adjustment zone, extending through said overwrap and partially penetrating said filter outer layer, such that the application of a bending moment to said filter element ruptures said outer layer within said adjustment zone.

4,648,414

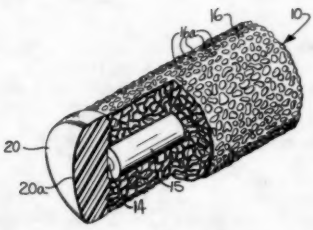
BENDABLE LIGHTWEIGHT ARTICLE FOR PERSONAL GROOMING AND METHOD OF MAKING

Steve A. Fox, Hickory, N.C.; Donald L. Murray, Gloucester, and Frederick Dinkin, Cambridge, both of Mass., assignors to Cel Co., Inc., Cambridge, Mass.

Filed Aug. 16, 1984, Ser. No. 641,718

Int. Cl.[4] A45D *2/18*

U.S. Cl. 132—43 R **13 Claims**



1. An elongate lightweight and readily bendable rod-like article adapted to be used for a variety of purpose such as a hair curling rod or wrist bracelet, said article comprising an elongate, low density, and continuous foam body formed entirely of closed cell foam, a pliable metallic core extending throughout the lenth of said body and serving to resiliently maintain

the body in any desired bent configuration, said foam body and said metallic core being of coextensive length, adhesive means surrounding said metallic core throughout the length thereof and bonding said metallic core to said body so that the body and metallic core are unitized and bend together, said adhesive means serving as a corrosion resistant protective coating on said metallic core, and end caps sealably connected to opposite ends of said body and completely covering the ends of the body and said metallic core to seal the same and to prevent liquid from coming into contact with the ends of the body and metallic more and also to provide a protective shield for opposite ends of said metallic core.

4,648,415

NAIL CLIPPER AND RETAINER AND DISPOSER OF NAIL CLIPPINGS

James J. Yuan, 222 W. 22nd Pl., Apt. 2-A, Chicago, Ill. 60616

Continuation-in-part of Ser. No. 585,264, Mar. 1, 1984, abandoned. This application Aug. 13, 1984, Ser. No. 640,162

Int. Cl.⁴ A45D *29/00*

U.S. Cl. 132—73 **12 Claims**

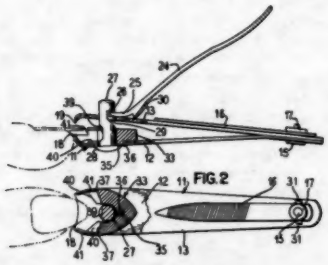


FIG. 2

1. A clipper for the nails of the fingers and toes constructed to decelerate and confine the nail clippings for disposal to waste comprising first and second leaf spring elements in superimposed relation with respect to each other having proximate ends biased apart and having cooperating sharpened cutting edges inturned with respect to plane surfaces of said leaf spring elements and cooperating with each other to clip a nail along the cooperating cutting edges thereof, a reaction pin having a head abutting an underside surface of said first leaf spring element and extending through both of said elements and having a recessed portion above said second leaf spring element, a lever having a bifurcated end, the furcations of which are formed to extend within said recessed portion and react thereagainst, and having a fulcrum extending from the side thereof opposite the bifurcated portion reacting against said recessed portion and engageable with a top surface of said second leaf spring element to serve as a fulcrum and move said cutting edges together by flexing said second leaf spring element relative to said first leaf spring element to effect a nail clipping operation, said post also having a recessed surface facing said sharpened inturned cutting edges for opening to opposite sides of said post, and a clippings decelerator and accumulator on said first leaf spring element and extending partially about said post and opening toward said cutting edges and having plane faces on opposite sides of the recessed surface of said post and forming outward continuations thereof and also having side walls conforming to side walls of the proximate end of said first leaf spring element and confining the clippings to the space between said post and said cutting edges for discharge to waste upon opening of said clipper and the shaking of the clipper from side to side with the cutting edges thereof facing downwardly.

4,648,416

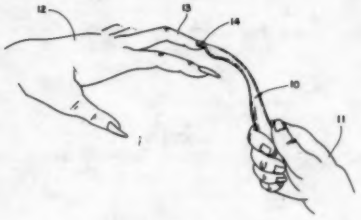
ARTIFICIAL FINGERNAIL APPLICATOR TOOL

Brenda J. Kilman, 420 W. 41st. St., San Bernardino, Calif. 92407, and Betty J. Cowart, 751 S. Sycamore, Rialto, Calif. 92376

Filed Aug. 20, 1984, Ser. No. 642,577

Int. Cl.⁴ A45D *40/26*

U.S. Cl. 132—88.7 **4 Claims**



1. An artifical fingernail applicator, comprising: a one-piece elongated handle of rigid material including an operator hand grip, said handle extending beyond said hand grip portion to an extremity;

means defining a pocket within said handle adjacent said extremity, said pocket being formed to open axially outward for receiving the outward end of an artificial fingernail, said pocket further being shaped to elastically deform said fingernail within the area inserted into said pocket to produce a frictional grip between said pocket and said artificial fingernail.

4,648,417

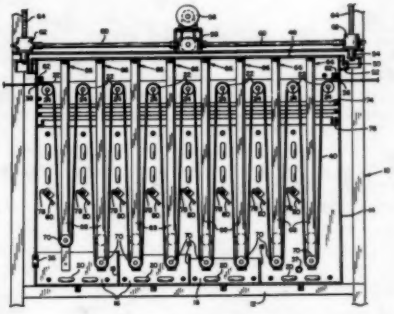
APPARATUS FOR DEGREASING A CONTINUOUS SHEET OF THIN MATERIAL

Peter E. Johnson, and James Young, both of Corvallis, Oreg., assignors to Entek Manufacturing Inc., Tangent, Oreg.

Filed Feb. 11, 1985, Ser. No. 700,525

Int. Cl.⁴ B08B *3/10*

U.S. Cl. 134—105 **4 Claims**



1. Apparatus for degreasing a continuous sheet of thin material comprising:

(a) a degreasing tank having a liquid portion defined in the bottom thereof and a cleaning zone defined immediately above said liquid portion;

(b) heating means located in said liquid portion for heating a liquid solvent located in said liquid portion to form vaporized solvent in said cleaning zone;

(c) condensing means located in said tank in a condensing zone, which is located above said cleaning zone, for condensing said vaporized solvent;

(d) material handling means for placing the material alternately into said condensing zone until it is cooled substantially below the temperature of said vaporized solvent and then into said cleaning zone until it has been warmed to approximately the temperature of said vaporized solvent a predetermined number of times while passing the material through said tank;

(e) wherein said material handling means comprises a first set of rollers located in said tank within said condensing zone and a second set of rollers located in said tank immediately above said liquid portion, said rollers being arranged such that the material will alternately pass over a roller in the first set and then under a roller in the second set as the material passes through said tank.

4,648,418

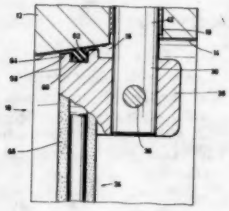
FIREPROOF VALVE ASSEMBLY AND VALVE ELEMENT FOR USE THEREIN

William B. Scoble, and Michael L. Wagberg, both of Houston, Tex., assignors to Keystone International, Inc., Houston, Tex.

Filed Mar. 5, 1986, Ser. No. 836,543

Int. Cl.⁴ F16K *17/14*

U.S. Cl. 137—67 **12 Claims**



1. A valve element for use in a rotary valve assembly having a valve housing defining a cavity for receiving said valve element, a seal means for effecting sealing between said valve element and said valve housing, said valve element comprising a body member forming an exterior valve element surface, and a coating of intumescent material disposed on at least a portion of said exterior valve element surface.

4,648,419

ASSEMBLY OF PIPES

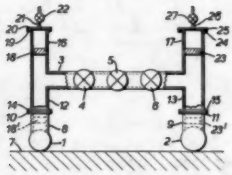
Jean-Luc Hervé, Noisy-le-Grand; Jean-Francois Jouanneau, Cassis, both of France; Ivar G. Kristensen, Forus, and Finn Haugen, Notodden, both of Norway, assignors to Total Compagnie Francaise des Petroles, France and Den Norske Stats Oljeselskap A/S, Norway

Filed Nov. 4, 1985, Ser. No. 794,996

Claims priority, application Norway, Nov. 2, 1984, 844356

Int. Cl.⁴ B08B *9/06*; F16K *51/00*

U.S. Cl. 137—245.5 **7 Claims**



1. An assembly of pipes comprising a first pipe submerged in water and provided with a first tubular connection portion, a tubular member detachably connected to said first pipe and having at one end a second tubular connection portion and an external first tubular extension which is coaxial with said second connection portion, the portion of said tubular member which is adjacent said second connection portion extending from the axis of said second connection portion, detachable first connecting means for connecting said first and second connection portions coaxially to one another, displaceable first closure means received in said tubular extension for closing either said tubular extension or said first connection portion and axially displaceable therebetween, and detachable first fastening means for selectively connecting to the end of said tubular extension either a first cover member or a casing of a first manipulator for displacing said closure means between said tubular extension and said first connection portion; and

wherein said tubular member establishes a detachable connection between said first pipe and a second pipe and at its other end is provided with a third tubular connection portion, for connection coaxially to a fourth tubular connection portion provided on said second pipe, and a second tubular extension coaxial with said third connection portion, axially displaceable second closure means being provided in said second tubular extension, and detachable second fastening means are provided for selectively connecting to the end of said second tubular extension either a second cover member or a casing of a second manipulator for displacing said second closure means from said second tubular extension to said fourth connection portion so that, with said first and second closure means in said first and fourth connection portions, respectively, said detachable first and second connecting means and said tubular member can be simultaneously detached while maintaining the interiors of the first and second pipes closed to the outside.

5. An assembly according to claim 1, wherein said first closure means is provided with a fifth extension which, when said first closure means is in said first tubular extension, partly reconstitutes the internal geometry which said tubular member would have had in the absence of said fifth tubular extension, said fifth extension serving as a guide for a scraper circulating in the tubular member.

4,648,420

FLUID CONTROL VALVE

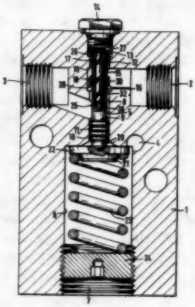
Lothar Kunze, Hofheim-Langenhain; Rolf Greeb, Kriftel, and Ralf Bender, Hofheim, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt, Fed. Rep. of Germany

Filed May 13, 1985, Ser. No. 733,716

Claims priority, application Fed. Rep. of Germany, May 11, 1984, 3417458

Int. Cl.⁴ F16K *23/00*

U.S. Cl. 137—312 **1 Claim**



1. A fluid control valve comprising, in combination:

a valve housing having an inlet opening and an outlet opening;

a cylinder bore in said housing extending generally traversely to the direction of fluid flow through said housing,

said bore having a first portion communicating with said inlet opening and a second portion axially spaced from said first portion and communicating with said outlet opening; said cylinder bore having an enlarged annular extension axially intermediate of and of a greater diameter than said first and second portions;

a control slider slidably disposed in said cylinder bore, said slider having an axially central recess portion separating first and second end portions of said slider the diameters of which are substantially equal to the diameter of said cylinder bore, said recess portion communicating with said outlet opening when said control valve is in its closed position;

a stepped bore in said housing coaxially extending away from one end of said cylinder bore, said stepped bore having a diameter significantly greater than the diameter of said cylinder bore;

a leakage oil port in said housing communicating with said stepped bore;

means in said stepped bore for engaging and resiliently urging said control slider toward the other end of said cylinder bore;

a pressure chamber in said housing at the other end of said cylinder bore communicating with said outlet opening;

wherein pressure developed in said pressure chamber translates said slider toward said one end of said cylinder bore until said first portion of said slider is located adjacent said second portion of said cylinder bore to restrict the flow of fluid between said inlet and outlet openings; and

wherein the diameter of said second portion of said slider is significantly less than the diameter of said first portion of said slider whereby leakage oil flowing through said annular extension passes to said leakage oil port through the annular gap between said second portion of said slider and the wall of said second portion of said cylinder bore.

4,648,421

VALVE DEVICE FOR CONTROLLING LIQUID FLOW

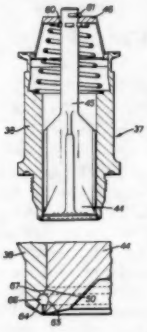
Nigel A. Chant, Bedfordshire; Richard W. E. Mosse, London, and Kevin Bunce, Hertfordshire, all of England, assignors to Liquipak International B.V., London, England

Filed Mar. 30, 1983, Ser. No. 480,395

Claims priority, application United Kingdom, Mar. 30, 1982, 8209318

Int. Cl.[4] F16K *17/04*

U.S. Cl. 137—312 **4 Claims**



1. A valve device for controlling liquid flow comprising a tubular housing, an annular valve seat on said housing and substantially co-axial therewith and bounding an internal surface of said housing and a valve member including a valve closure part and extending substantially co-axially in said housing and movable relative to said housing downwardly axially thereof from a closed condition in which said closure part acts sealingly against said valve seat round an annulus of sealing to an open condition in which said closure part is spaced from said valve seat, said housing having wetted internal surface portions which when liquid passes downwardly through said housing when said closure part is open are normally contacted by said liquid and said valve member having wetted external surface portions which when said liquid passes downwardly through said housing when said closure part is open are normally contacted by said liquid, at least one of said wetted internal surface portions of said housing below and thus downstream of said annulus of sealing and said wetted external surface portions of said valve closure part below and thus downstream of said annulus of sealing bounding an annular groove substantially co-axial with said housing for receiving and retaining liquid squeezed out downwardly at said valve seat, said groove, when said closure part is in said closed condition, forming part of a substantially enclosed space between said housing and said closure part for receiving and retaining liquid squeezed out downwardly at said valve seat, and said space extending downwardly from immediately adjacent to said valve seat to the lower extremities of said housing and said valve member, whereby neither said housing nor said valve member has any substantial wetted surface portions below the lowermost extremity of said space.

4,648,422

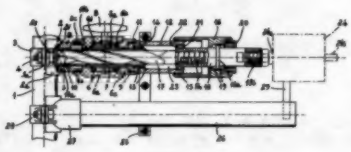
APPARATUS FOR DRILLING INTO A PIPE UNDER PRESSURE

Albert Amblard, 22, rue des Essarts, Bron (Rhone), France

Filed Apr. 23, 1985, Ser. No. 726,582

Int. Cl.[4] F16L *55/18*

U.S. Cl. 137—318 **12 Claims**



1. An apparatus for drilling a pipe under pressure to form a branch, comprising:

means forming a tee-fitting secured to said pipe at a location adapted to form a branch;

an isolating valve mounted on said tee-fitting and having a passage in an open position of said valve;

a barrel extending continuously through said tee-fitted and said valve from a wall of said pipe to a location remote from said wall and beyond said valve;

a drill bit rotatable in and closely surrounded by said barrel, said drill bit having flutes for carrying drilling debris formed upon drilling through said wall to said location;

a connector releasably connected to said valve and sealingly engaging said barrel, said barrel extending through said connector, said location lying beyond said connector; and

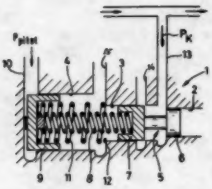
a casing having a greater internal diameter than the external diameter of said barrel and being radially spaced from said wall by less than the axial lengths of said flutes, said casing surrounding said drill bit at said location with all-around clearance to define with said drill bit a debris-receiving compartment while said drill bit is drilling through said wall, said casing being connected to said valve by said connector, said flutes extending into said compartment to deliver debris removed from said wall to said compartment.

4,648,423

CLUTCH-PRESSURE CONTROL VALVE

Fritz Henken, Pulheim, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 22, 1985, Ser. No. 757,565
Int. Cl.[4] G05D *16/10*
U.S. Cl. 137—494 **8 Claims**



1. A clutch pressure control valve for a hydraulically actuated friction clutch comprising:

a source of hydraulic pressure;

a valve bore communicating with the source of hydraulic pressure and having an outlet port from which the friction clutch is supplied;

valve means movable within the valve bore for opening and closing communication between the outlet port and the hydraulic pressure source;

a reaction piston movable within the valve bore;

means for producing a force on the reaction piston whose magnitude varies non-linearly with the displacement of said reaction piston;

means for producing a speed dependent pressure on the reaction piston that opposes the effect on the reaction piston of the non-linear force producing means; and

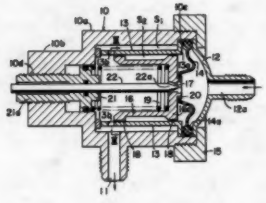
means for producing a force on the valve means whose magnitude varies proportionally with changes in the distance between the valve means and the reaction piston.

4,648,424

LIQUID FLOW RATE CONTROLLER

Yutaka Takahashi, and Yasutada Takahashi, both of Kanagawa, Japan, assignors to Kirin Beer Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 1984, Ser. No. 575,814
Claims priority, application Japan, Feb. 9, 1983, 58-17636[U]
Int. Cl.[4] G05D *7/01*
U.S. Cl. 137—504 **1 Claim**



1. A liquid flow controller for controlling the outflow rate of a liquid containing a great many solid particles such as fresh fruit or vegetable juice or the like, said liquid flow controller comprising:

(a) a casing having at least one liquid inflow opening and at least one liquid outflow opening;

(b) a cylindrical valve body slidably accommodated in the casing, one end of the valve body being closed by an end plate having an orifice while the other end thereof is open;

(c) elastic means for urging upstream the valve body;

(d) a plurality of outlet ports disposed at a space interval on the downstream side of the casing in its circumferential direction for discharging the liquid from the interior of the casing;

(e) a plurality of sliding projections formed on the outer surface of the cylindrical valve body for the provision of a wide space between the inner surface of the casing and the outer surface of the cylindrical valve body, the sliding projections being separated into two groups one of which is formed on the upstream side of the valve body and the other of which is formed at the down stream end of the valve body, each sliding projection of the other group being disposed in registration with each outlet port of the casing in their circumferential direction, the outflow rate of the liquid being adjusted in a manner that each sliding projection of the other group opens and closes each outlet port when the valve body is moved in the casing in response to change of the liquid pressure therein;

(f) a flexible diaphragm provided between the casing and the end plate of the valve body for preventing the inflow liquid from passing through the space to directly reach the outflow opening without passing through the interior of the valve body; and

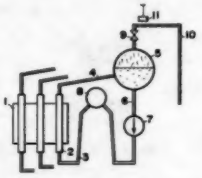
(g) an adjusting needle having a tapered end which can be adjustably inserted into the orifice formed in the end plate in order to narrow and widen the orifice.

4,648,425

SYSTEM AND METHOD OF CONFIRMING OPERATION OF A STEAM RELIEVING SAFETY VALVE FOR A WATER-COOLED NUCLEAR REACTOR

Kenshu Watanabe, Mito; Tadashi Uchikawa, Oarai; Masashi Takiyama, Tokyo, and Takashi Kurahashi, Tsuruga, all of Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Aug. 20, 1980, Ser. No. 179,879
Claims priority, application Japan, Sep. 10, 1979, 54-115973
Int. Cl.[4] F16K *37/00*
U.S. Cl. 137—557 **6 Claims**



1. In a water cooled nuclear reactor of the type in which water is used as a primary coolant and including a steam drum, a steam relief pipe, and a steam relieving safety valve disposed between said steam drum and said relief pipe, said safety valve being opened to relieve the internal pressure in said steam drum when said interval pressure increases over a predetermined maximum pressure, the improvement comprising:

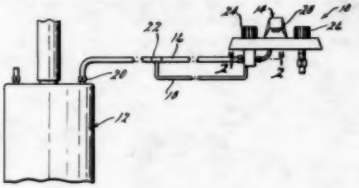
means for detecting an opened condition of said safety valve and thereby for confirming proper operation thereof, said detecting and confirming means comprising contact type acoustic emission sensor means, mounted solely on the exterior of at least one of said safety valve and said steam relief pipe, for detecting acoustic vibrations which are generated by steam being relieved from said safety valve when said safety valve is opened and which are transmitted through a solid material of said at least one of said safety valve and said steam relief pipe.

4,648,426

HOT WATER SUPPLY SYSTEM

Steven L. Oberholtzer, 131 E. Lovell, Troy, Mich. 48098

Filed Jun. 20, 1985, Ser. No. 746,879
Int. Cl.[4] F24H 1/00; E03C 1/044
U.S. Cl. 137—603 19 Claims



1. A hot water supply system adapted to provide hot water at a given maximum flow rate, comprising:

hot water supply means,

a water discharge outlet,

an auxiliary water supply pipe connecting said discharge outlet with said hot water supply means, said auxiliary pipe having an internal diameter smaller than that necessary to provide water flow at said maximum flow rate whereby means are provided for minimizing the volume of water retained by said auxiliary pipe,

a primary water supply pipe connecting said discharge outlet with said hot water supply means, and

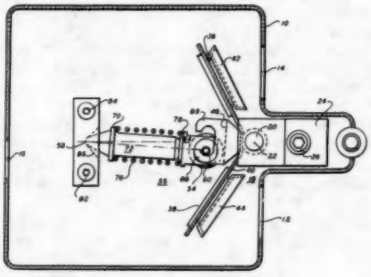
valve means for controlling water flow through said auxiliary and said primary water supply pipes, said valve means permitting water flow only through said auxiliary pipe at a first setting of said valve means whereby hot water rapidly displaces water in said retained volume of said auxiliary pipe and therefore becoming quickly available at said discharge outlet, said valve means permitting flow through said primary pipe at a second setting of said valves means to provide water at said maximum flow rate.

4,648,427

BISTABLE TWO POSITION VALVE

Kevin M. Fruechte, Fairmont, Minn.; Gary J. Andrewjeski, DeForest, and Robert E. Brastz, Sun Prairie, both of Wis., assignors to The BOC Group, Inc., Montvale, N.J.

Filed Sep. 30, 1985, Ser. No. 781,423
Int. Cl.[4] F16K 11/062, 1/20
U.S. Cl. 137—826 3 Claims



1. A selector valve for switching between two positions, said selector valve comprising:

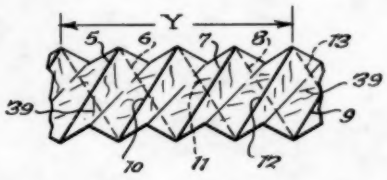
a valve housing, said valve housing having a pair of inlet ports, an outlet port and flow paths between said inlet ports and said outlet port; a valve operator pivotably affixed to said valve housing about a point, said valve operator having a pair of port closures depending outwardly therefrom at an angle with respect to each other, said valve operator being moveable by a user to two positions, said valve operator in one of its two positions having one of said port closures covering one of said inlet ports and in its other position having the other of its port closure covering the other of said inlet ports; said valve operator further having a substantially flat bearing surface facing outwardly from the valve operator pivot point, said bearing surface forming a plane perpendicular to a line bisecting the angle between said port closures, a pivot arm having one end pivotably affixed to said housing oppositely with respect to and spaced from said bearing surface, roller means affixed to the other end of said pivot arm contacting said bearing surface, and moveable along said bearing surface, bias means creating a force exerted by said roller means against said bearing surface, constraining means on said valve operator to constrain the movement of said roller means along said bearing surface to two remote positions, said roller force acting against said bearing surface in said remote positions to force said valve operator to one or the other of its two positions, said roller means having no stable intermediate position between said two remote positions along said bearing surface.

4,648,428

SHIRRED TUBULAR MATERIAL

Alfred D. Story, Danville, Ill., assignor to Teepak, Inc., Oak Brook, Ill.

Filed Dec. 21, 1984, Ser. No. 684,517
Int. Cl.[4] F16L 11/10
U.S. Cl. 138—118.1 18 Claims



1. A method for shirring synthetic sausage casings comprising sequentially applying shirring forces through at least two sets of shirring elements, each set comprising a plurality of successively arranged member shirring elements, progressively and continuously longitudinally in two or more substantially parallel, helical lines along the periphery of the casing, each successive member shirring element of each set applying shirring forces along a different helical line than that helical line of the immediate preceding successive member shirring element of the set.

4,648,429

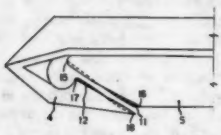
WEFT CARRYING GRIPPERS FOR SHUTTLELESS WEAVING LOOMS

Luigi Pezzoli, Leffe, Italy, assignor to Vamatex S.p.A., Villa Di Serio, Italy

Filed May 31, 1985, Ser. No. 740,034
Claims priority, application Italy, Jun. 7, 1984, 21291 A/84
Int. Cl.[4] D03D 47/20
U.S. Cl. 139—448 1 Claim

1. A weft carrying gripper of the type wherein the weft yarn is retained by engagement of head of a slider moving lengthwise, with a counteracting cooperating surface of the gripper body, said slider being thrust forward by a spring and being released by pulling a flexible lamina element connected thereto; the improvement in which the slider head of the gripper is shaped like a helical wedge, adapted to mate with an

equally shaped counteracting surface of the gripper body, said wedge having an upper forward edge and a lower rear edge and facing forwardly and downwardly and being inclined toward one lateral side adjacent one of said edges and toward the other lateral side adjacent the other of said edges, said



counteracting surface extending from an upper forward edge to a lower rear edge and facing rearwardly and upwardly and being inclined, adjacent its said edges, toward the same lateral sides as said wedge adjacent the respective said edges of said wedge.

4,648,430

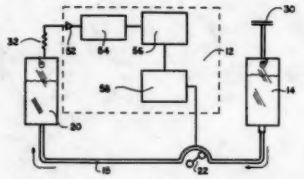
DEVICE AND METHOD FOR COLLECTING A DESIRED WEIGHT AMOUNT OF A MATERIAL

Aleandro Di Gianfilippo, Arlington Heights; Alan A. Figler, Algonquin; Leon Huang, Hoffman Estates, and Donald Warner, Gurnee, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 623,818, Jun. 22, 1984, abandoned. This application Apr. 14, 1986, Ser. No. 852,090

Int. Cl.[4] B65B *3/28*

U.S. Cl. 141—1 **15 Claims**



1. A method of collecting a desired end-point weight amount of a material in a collection container in which the desired end-point weight amount can be different each time the method is performed, said method comprising the consecutive steps of:

(a) receiving a signal indicating the desired end-point weight amount,

(b) calculating a predetermined weight amount by subtracting a fixed offset weight amount from the desired end-point weight amount,

(c) conveying the material into the collection container and weighing the material until said predetermined weight amount is collected,

(d) conveying for an initial fixed time period an initial incremental weight amount of material into the container, the initial incremental weight amount being less than the fixed offset weight amount,

(e) calculating a present weight offset amount by subtracting the then existing weight amount of material in the container from the desired end-point weight amount,

(f) calculating a calculated time period by multiplying the initial fixed time period by the quotient of the present weight offset amount and the initial incremental weight amount,

(g) conveying additional material into the collection container for said calculated time period, and

(h) repeating steps (e) through (g) until the then existing weight amount equals or exceeds the desired end-point weight amount.

4,648,431

HAND CONTROLLED FILLING VALVE FOR FILLING CONTAINERS WITH GASEOUS MEDIUM

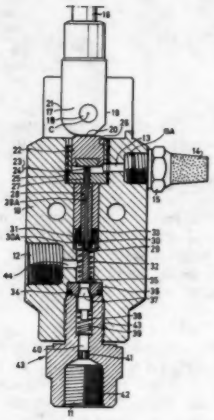
Lars H. Strongert, and Sten O. T. Lindgren, both of Linköping, Sweden, assignors to Spiromec AB, Linköping, Sweden

Filed Sep. 17, 1985, Ser. No. 776,381

Claims priority, application Sweden, Sep. 17, 1984, 8404666

Int. Cl.[4] B65B *3/04*; F16K *11/14*

U.S. Cl. 141—18 **4 Claims**



1. In a filling valve for filling containers with gas under pressure up to 300 bars, such as from a compressor, for example, the valve having a housing, a gas inlet in the housing for the gas under pressure, a gas outlet arranged on one side of the housing for connection to a container to be filled, a venting outlet arranged on the other side of the housing for venting to the atmosphere after a filling operation, an inlet channel in the housing between the gas inlet and gas outlet, a venting channel in the housing between the gas outlet and venting outlet, a venting valve in the venting channel, and an operating device for opening and closing the inlet channel and venting valve, the improvement comprising:

an extension of the inlet channel between the gas inlet and inlet channel;

an inlet valve seat in said extension;

a conical inlet valve in said extension operatively engageable with said inlet valve seat;

a valve resetting spring means for resiliently urging said inlet valve into sealing engagement with said inlet valve seat;

a further extension of the inlet channel between the inlet channel and the venting channel;

a spindle displaceably mounted in the housing having a part thereof disposed in said further extension and having first and second ends, said first end engaging said inlet valve and being displaceable by the operating device for opening and closing said inlet valve;

a return spring means for resiliently urging said spindle in a direction opposite to said displacement by the operating device;

said venting channel comprising a straight hollow spindle channel concentrically arranged in said spindle and having an inner end, a spindle channel inlet port extending through said spindle and communicating said inner end of said spindle channel with said further extension of said inlet channel, and a further channel having one end communicating with said venting outlet;

a venting valve seat on said second end of said spindle and forming part of said spindle channel;

an operating piston displaceably mounted in a piston bore in said housing; and

a venting valve member on said piston operatively engageable with said venting valve seat for opening and closing said spindle channel;

said further venting channel having an end communicating with said piston bore;

the operating device being adapted in a filling position to move said operating piston so that said venting valve member engages said venting valve seat to close said spindle channel and displace said spindle to open said inlet valve for filling a container, in a closed position to move said operating piston into closing engagement between said venting valve member and said venting valve seat and said resetting spring closes said inlet valve, and in a venting position to set said operating piston in a position where said venting valve member is disengaged from said venting valve seat and said inlet valve is closed by said resetting spring.

4,648,432

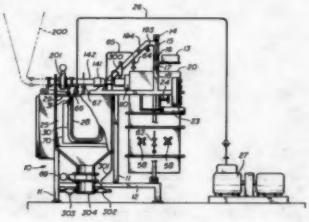
VACUUM APPARATUS FOR FILLING BAGS WITH PARTICULATE MATERIAL INCLUDING DUST COLLECTOR AND RECYCLING OF COLLECTED MATERIAL

Emmanuel Mechalas, 2830 Townway, Danville, Ill. 61832

Filed Jul. 12, 1985, Ser. No. 754,856

Int. Cl.[4] B65B *1/26, 1/18, 3/17*

U.S. Cl. 141—68 **21 Claims**



1. A bag filling machine for powders and other finely divided material comprising;

a shroud providing a chamber for receiving a bag during the filling thereof and having hingeably connected segments which open to permit introduction and removal of the bags being filled,

means for weighing a selected amount of material dispensed into the bag within the shroud,

a feed spout having an outlet end for insertion into the mouth of a bag positioned therein for filling,

a material supply hopper supplying powders or other finely divided material to said feed spout and the bag filled thereby and a first valve actuatable to control the flow of powder or other finely divided material from the hopper to said feed spout,

means for applying a vacuum to the interior of said shroud surrounding the bag supported therein to draw particles of material from said hopper into the bag positioned on said spout,

a dust collector connected between said shroud and vacuum-applying means to collect particles of material in the air withdrawn from said shroud during said filling operation,

said dust collector including back flushing means and container means receiving particles released from said collector in back flushing, and

conduit means connected from said container means for re-cycling particles therefrom into the bag being filled.

4,648,433

MILLING DEVICE

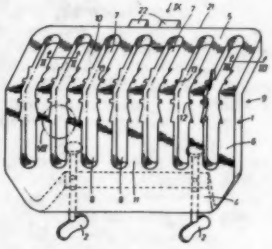
Robert Wolff, Im Kiesacker 12, 5446 Engeln, Fed. Rep. of Germany

Filed Nov. 12, 1985, Ser. No. 796,809

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1984, 3440945

Int. Cl.[4] B27F *1/14*; B27L *5/10*

U.S. Cl. 144—144.5 GT **9 Claims**



9. A gauge for guiding a milling cutter into boards which are to be joined together at right angles by comb-like wedge joints, the gauge comprising a guiding plate, an aligning plate joined by a corner area to said guiding plate, a plurality of spaced parallel slit means extending across the aligning plate and the guiding plate for guiding a guiding piece of the milling cutter, at least one aligning finger means provided at a free edge of the aligning plate said at least one aligning finger means projecting orthogonally with respect to an extension of the slit means of the guiding plate, said at least one aligning finger means being disposed so as to be aligned with a portion of the aligning plate remaining between two adjacent slit means, and wherein a cross-section of the at least one aligning finger means is adapted to an outline of grooves to be milled.

4,648,434

ANTISKID DEVICE FOR MOTOR VEHICLE TIRES

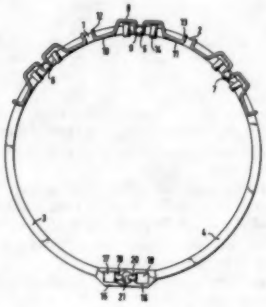
Carlo Melzi, and Paolo Gregorutti, both of Tarvisio, Italy, assignors to Acciaierie Weissenfels S.p.A., Tarvisio, Italy

Filed Sep. 24, 1984, Ser. No. 653,936

Claims priority, application Italy, Mar. 26, 1984, 21361/84[U]

Int. Cl.[4] B60C *27/10, 27/06*

U.S. Cl. 152—213 A **5 Claims**



1. An antiskid device mountable on motor vehicle tires and comprising an inner fastening adapted to engage the inside of a tire, said inner fastening in both its unmounted and mounted or fitted state on the tire normally having an essentially circular form and comprising a central mounting portion having free ends swivably connected to side part portions by swivel joints,

the side part portions, for facilitating fitting the inner fastening to the inside of the tire, being radially outwardly movable relative to the central mounting portion when said inner fastening is in the normal essentially circular form and being normally pretensioned by spring means in both its unmounted and mounted or fitted state to automatically urge said side part portions into closed form, the central mounting portion comprising at least two portions swivably connected by a swivel joint for movement toward one another and being also pretensioned by spring means in a radially inward direction so that the inner fastening, constituted of said central mounting portion and said side part portions, is normally in said essentially circular form in both its unmounted and mounted or fitted state, all said spring means comprising leg springs having an intermediate part supported on the swivel joints and outer leg parts supported on associated of said central and side part portions of said inner fastening, and stop means for said swivel joints and said portions interconnected thereby for locking against further swivelling movement of said portions in a first direction beyond said essentially circular form one said essentially circular form is attained and in a second direction to limit movement of said portions when said side part portions are moved in a direction away from said essentially circular form.

4,648,435

BOAT WINDOW

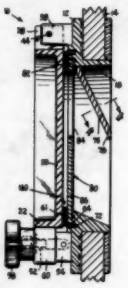
Frank S. Beckerer, Jr., 40 Dock Rd., Milford, Conn. 06460, and William F. Spangler, Milford, Conn., assignors to Frank S. Beckerer, Jr., Milford, Conn.

Continuation-in-part of Ser. No. 515,470, Jul. 20, 1983, Pat. No. 4,572,266, and a continuation-in-part of Ser. No. 239,250, Mar. 2, 1981, abandoned. This application Oct. 21, 1985, Ser. No. 789,779

The portion of the term of this patent subsequent to Feb. 25, 2003, has been disclaimed.

Int. Cl.[4] E06B *3/30*

U.S. Cl. 160—92 **12 Claims**



6. A boat window, comprising in combination:

(a) a frame body comprising a mounting flange for engagement with an inner surface surrounding an opening in the wall of a boat,

(b) said frame body including a spigot connected with the flange and defining the window opening, said spigot being adapted to extend through said wall opening of the boat,

(c) a window pane for selectively closing off the window opening formed by the spigot,

(d) means hingedly connecting said window pane to the said mounting flange,

(e) a removable window screen unit comprising a screen frame carried by the frame body of the boat window, said screen frame having in its lower portion a vertical water shield panel extending over and spanning the lower area of the screen frame to protect against splashes through the frame body when the window pane is open,

(f) said window screen unit having a mesh panel disposed permanently essentially coplanar with said water shield panel and extending between said vertical water shield panel and the upper edge of the screen frame, said mesh panel enabling air to circulate through the upper portion of the screen unit,

(g) said vertical water shield panel having an upper edge which borders said mesh panel,

(h) said screen unit being removable from the frame body of the boat window as a unitary assemblage, such that the window can be equipped instead with a conventional screen, as desired.

4,648,436

VERTICAL LOUVRE BLIND AND PARTS THEREFOR

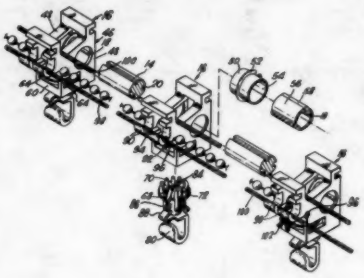
Herman Oskam, Bergambacht, Netherlands, assignor to Hunter Douglas International N.V., Curacao, Netherlands

Filed Feb. 16, 1984, Ser. No. 580,681

Claims priority, application United Kingdom, Mar. 24, 1983, 8308061

Int. Cl.[4] E06B *9/30*

U.S. Cl. 160—168 R **10 Claims**



1. A traveller for holding a louvre of a vertical louvre blind headrail, said traveller comprising a housing, means to support and guide the housing within the blind headrail, a worm rotatably mounted in said headrail for rotation about a horizontal axis by a tilt rod passing longitudinally through the headrail, a lower wall on the housing below the worm, an open ended slot extending from one open end of the lower wall in a direction transverse to the axial direction of the headrail and to a position adjacent said worm, a rotatable wormwheel, having an axis of rotation, a bearing surface extending parallel to said axis of rotation, and means permitting said bearing surface to be slidable into said slot along a direction perpendicular to said axis of rotation and along said transverse direction to said position in which said wormwheel is in operable engagement with the worm, and means to retain the wormwheel in this position.

4,648,437

METHOD FOR PRODUCING A METAL ALLOY STRIP

Michael J. Pryor, Woodbridge, Conn., and Michael L. Santella, Knoxville, Tenn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 570,123, Jan. 12, 1984, which is a continuation-in-part of Ser. No. 499,008, May 27, 1983, abandoned. This application Dec. 16, 1985, Ser. No. 809,664

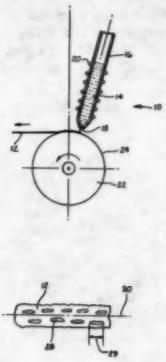
Int. Cl.[4] B22D *11/00*

U.S. Cl. 164—463 **16 Claims**

1. A method for producing a metal alloy strip, comprising the steps of:

(a) providing a melt of metal alloy consisting essentially of about 20 to 60% by weight of iron and the balance being a material selected from the group consisting of copper and alloys thereof, said material forming a matrix; and

(b) rapidly solidifying said melt into said metallic strip having substantially fine, equiaxed particles of iron or iron



alloy distributes substantially homogenously throughout said matrix, said equixed particles having a width between about 0.05 to about 0.5 microns.

4,648,438

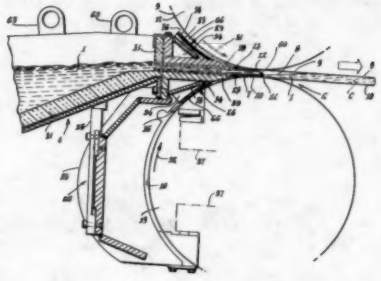
METHOD AND APPARATUS FOR FEEDING AND CONTINUOUSLY CASTING MOLTEN METAL WITH INERT GAS APPLIED TO THE MOVING MOLD SURFACES AND TO THE ENTERING METAL

Robert W. Hazelett; Charles J. Petry, both of Colchester, and Stanley W. Platek, Essex Junction, all of Vt., assignors to Hazelett Strip-Casting Corporation, Colchester, Vt.

Continuation of Ser. No. 631,582, Jul. 17, 1984, abandoned, which is a continuation of Ser. No. 372,459, Apr. 28, 1982, abandoned. This application Aug. 15, 1985, Ser. No. 766,076

Int. Cl.[4] B22D *11/06, 11/00*

U.S. Cl. 164—475 **24 Claims**



1. The method for continuously casting metal product directly from molten metal, wherein the molten metal is introduced into a moving mold whose downstream direction is approximately horizontal or downwardly inclined, said moving mold being defined between the mold surfaces of two opposed, cooled moving endless flexible casting belts and laterally defined by first and second travelling side dams, the method comprising:

inserting a metal-feeding nosepiece into the entrance to said moving mold and holding said nosepiece in position with clearance gaps of more than 0.010 of an inch (0.25 mm) and less than 0.050 of an inch (1.27 mm) between said nosepiece and said moving mold surfaces,

providing at least one metal-feeding passage extending downstream in said nosepiece and feeding the molten metal through said metal-feeding passage into the entrance to said moving mold,

providing at least one gas-feeding passage extending downstream in said nosepiece and feeding an inert gas through said gas-feeding passage at a pressure slightly exceeding atmospheric pressure directly into the entrance to said moving mold, said inert gas being inert and essentially non-reactive in relation to the metal being cast,

maintaining the level of the molten metal in the entrance of the moving mold downstream from the metal-feeding passage in the nosepiece thereby creating a cavity in the entrance to the moving mold adjacent to the nosepiece,

feeding the inert gas directly from said gas-feeding passage into said cavity for charging said cavity with the inert gas at a pressure exceeding atmospheric pressure for controlling the gas content of said cavity, and

channeling the inert gas flowing out from the entrance to the moving mold through said clearance gaps to flow upstream in close proximity to the moving mold surfaces as they are approaching the entrance for causing said channeled gas to cleanse and displace atmospheric gases off from the respective moving belt surfaces before they enter the moving mold.

4,648,439

METHOD FOR THE CONTINUOUS CASTING OF METAL BETWEEN TWO AXIALLY PARALLEL COOLED CYLINDERS

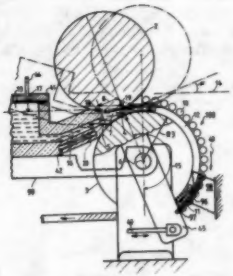
Fritz Willim, Birmensdorf, Switzerland, assignor to Concast Service Union AG, Zürich, Switzerland

Filed Feb. 21, 1985, Ser. No. 704,022

Claims priority, application Switzerland, Mar. 1, 1984, 998/84

Int. Cl.[4] B22D *11/06*

U.S. Cl. 164—480 **9 Claims**



1. A method of continuously casting metal strands, especially steel in the form of a band or thin slab, between two axially parallel cooled rolls each having a cylindrical surface of substantially the same diameter, comprising the steps of:

feeding molten metal into a hollow mold chamber delimited by the two axially parallel cooled rolls;

moving said cylindrical surfaces as mutually confronting outer surfaces of the two axially parallel cooled rolls essentially uniformly in the direction of metal feed substantially at the speed of extraction of the strand being cast such that both of said two axially parallel cooled rolls are in contact with the strand being cast along the entire length of said hollow mold chamber;

restraining the cast strand aginst the outer surface of one roll of the two axially parallel cooled rolls subsequent to passage through a location of closest roll spacing;

selecting, in relation to a predetermined cooling capacity of the outer surfaces of the cooling rolls located within said hollow mold chamber, a ratio of strand thickness to cast-

ing speed such that there are fulfilled the condition that the strand leaves said location of closes roll spacing defining the narrowest gap between the cooled rolls with a still considerable portion of liquid core and that fully complete solidification occurs only after attaining the region in which the strand has been further cooled and restrained against said one roll of the two axially parallel cooled rolls by a support apron over an angle of at least 90°;

maintaining the tangential speeds of the outer surfaces of both of said two axially parallel cooled rolls in contact with broad sides of the strand being cast to be mutually different from one another;

said one roll of said two axially parallel cooled rolls having a predetermined radius;

a relationship of a first tangential speed of said tangential speeds that is associated with said one roll of said two axially parallel cooled rolls to a second tangential speed of said tangential speeds that is associated with the remaining roll of said two axially parallel cooled rolls being;

$$V_2 = V_3 \cdot \frac{R_3 + d}{R_3}$$

wherein:

V_2 is said second tangential speed;

V_3 is said first tangential speed;

R_3 is said predetermined radius of said one roll; and

d is the spacing between said two axially parallel cooled rolls at said location of closest roll spacing.

4,648,440

APPARATUS FOR THE CONTINUOUS CASTING OF METAL

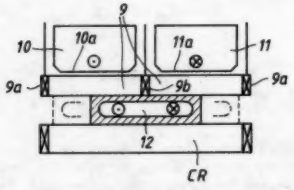
Conny Andersson, and Sten Kollberg, both of Västerås, Sweden, assignors to Asea AB, Västerås, Sweden

Continuation-in-part of Ser. No. 266,003, May 21, 1981, abandoned, which is a continuation of Ser. No. 99,079, Nov. 30, 1979, abandoned. This application Aug. 24, 1982, Ser. No. 410,885

Claims priority, application Sweden, Dec. 1, 1978, 7812382

Int. Cl.⁴ B22D *11/128, 27/02*

U.S. Cl. 164—504 **1 Claim**



1. Continuous casting apparatus comprising at least one non-magnetic roller which contacts a side of a continuously cast traveling strand of magnetic metal having a solidified skin containing unsolidified metal, said roller being journaled at both of its ends by end bearings and at least one interposed position between said ends by an interposed bearing, each length of said roller between each two of said bearings having an inductive stirrer positioned on the outside thereof and extending longitudinally with respect to the strand and having a front face adapted to project a traveling magnetic field forwardly through said length into said strand, said front face having a width substantially coextensive with said length, in each instance, so as to cause direct inductive stirring of said unsolidified metal throughout the width of said strand regardless of the width of the strand.

4,648,441

HEAT EXCHANGER COMPRISING A FINNED PIPE

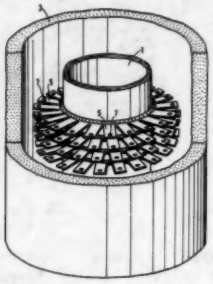
Willem L. N. van de Sluys; Jacobus Pastoor, and Johannes C. M. Roelofs, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 29, 1985, Ser. No. 728,437

Claims priority, application Netherlands, Oct. 30, 1984, 8403278

Int. Cl.⁴ F28B *3/02*

U.S. Cl. 165—111 **9 Claims**



1. A heat exchanger which comprises a vertically arranged circular-cylindrical holder closed at its upper end and at its lower end; an inner pipe coaxially arranged within the holder; a fin secured to the inner pipe and consisting of a plurality of interconnected lamellae extending radially from the pipe, said fin being helically wound around the pipe so that the adjacent lamellae of successive turns of the resulting helix overlap each other in part, viewed in the circumferential direction of the pipe; and a capillary passage located in each lamella above the surface of an underlying lamella in a position shifted with respect to the capillary passage of the underlying lamella.

4,648,442

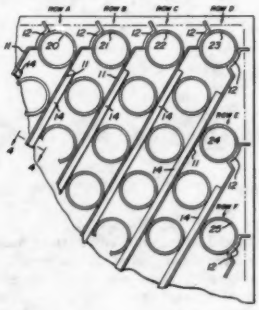
STAKE FOR A TUBE BUNDLE

George J. Williams, 36 Hickory La., Chalfont, Pa. 18914

Filed Dec. 10, 1985, Ser. No. 807,312

Int. Cl.⁴ F28F *1/00*

U.S. Cl. 165—162 **11 Claims**



1. An elongated stake for maintaining the tubes of a tube bundle in a spaced apart relationship which comprises:

(1) a longitudinal segment having a top surface and a bottom surface characterized by a channel of generally U-shaped cross-section which extends approximately the length of said segment, said channel being bounded on opposite sides by obliquely disposed flat members which extend outwardly from said channel;

(2) a generally arcuate segment for engaging a section of a tube in said tube bundle; and

(3) a flat and obliquely disposed connecting member which joins said longitudinal segment to said arcuate segment.

4,648,443

HEAT EXCHANGER WITH RIBBED FIN

László Szucs; József Szabó, and Csaba Tasnádi , all of Budapest, Hungary, assignors to Energiagazdalkodasi Intezet, Budapest, Hungary

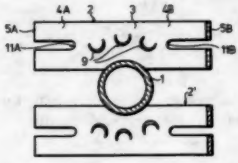
PCT No. PCT/HU82/00002, § 371 Date Oct. 21, 1982, § 102(e) Date Oct. 21, 1982, PCT Pub. No. WO82/02763, PCT Pub. Date Aug. 19, 1982

Continuation of Ser. No. 438,859, Oct. 21, 1982, abandoned. This PCT application Feb. 2, 1982, Ser. No. 815,755

Claims priority, application Hungary, Feb. 6, 1981, 292/81

Int. Cl.[4] F28F *1/30*

U.S. Cl. 165—181 **9 Claims**



2. A heat exchanger comprising:

at least one tube made of a heat conducting material for circulating a first fluid medium,

for each tube two strip ribbings attached to said tube in heat-conducting relationship along diametrically opposite sides of said tube to increase the heat exchange between the first fluid medium and a second fluid medium passing the tube substantially parallel to surfaces of said ribbings,

each of said ribbings being made of a heat conducting strip material folded to an accordion-like shape to form a plurality of spaced ribs and connecting parts connecting the adjacent ribs at alternate ends,

each of said ribs comprising two wings overhanging opposite sides of said tube and a rib base between said wings, said overhanging wings of each rib being separated by a gap from the overhanging wings of the other ribbing of the respective tube,

said connecting parts being joined with the ends of the wings of the adjacent ribs,

each of said ribbings being attached to said tube at its rib bases along one side of said tube so that the ribs extend transversely to an axis of said tube and the two ribbings are not in direct contact with each other,

each of said ribs comprising at least one discontinuity interrupting the continuity of the wing material in the direction of lines along which the ribbing is folded whereby boundary layers of the second fluid medium formed along the wing surfaces are at least partly interrupted,

said discontinuity comprising a cutout beginning in the connecting part and extending lengthwise along the wing.

4,648,444

TENSILE RING CABLE HEAD ASSEMBLY

Randolph A. Busch, Sugarland, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Apr. 17, 1985, Ser. No. 724,365

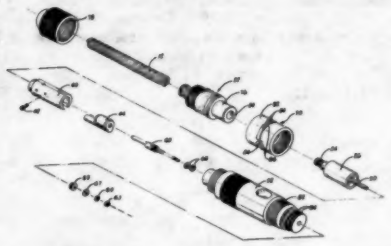
Int. Cl.[4] E21B *47/00*

U.S. Cl. 166—65.1 **16 Claims**

1. A cable head for connecting a logging cable to a well logging tool, comprising:

means for electrically connecting said cable to said tool in a longitudinally separable manner;

means for mechanically connecting said cable to said tool, including a weak point element comprising a substantially tubular ring having two ends and a circumferentially extending reduced tensile strength zone therebetween



adapted to part throughout the entire circumferential extent thereof upon longitudinal loading in tension of said ring through said ends.

4,648,445

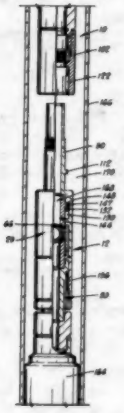
RETRIEVING MECHANISM

Kenneth D. Caskey, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Dec. 13, 1985, Ser. No. 808,586

Int. Cl.[4] E21B *31/18*

U.S. Cl. 166—98 **19 Claims**



1. A tool retrieving apparatus for retrieving and releasing a downhole tool, said apparatus comprising:

overshot means attached to one of said tool and a tool string;

mandrel means attached to the other of said tool and said tool string and defining a threaded portion thereon, said mandrel means having a portion engageable with said overshot means;

releasable connecting means for threadingly connecting said overshot means to said mandrel means upon longitudinal insertion of said mandrel means into said overshot means, and for disconnecting said overshot means from said mandrel means upon rotation of said overshot means relative to said mandrel means, and

rotational engagement means operably associated with said overshot means and said mandrel means, for selectively preventing rotation of said overshot means relative to said mandrel means.

4,648,446

WIRELINE SET/TUBING RETRIEVE PACKER TYPE BRIDGE PLUG

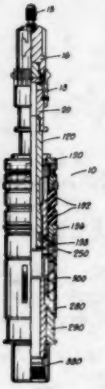
William M. Fore, and Kenneth D. Caskey, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jun. 27, 1985, Ser. No. 750,557

The portion of the term of this patent subsequent to Oct. 8, 2002, has been disclaimed.

Int. Cl.[4] E21B *23/06*

U.S. Cl. 166—123 **20 Claims**



1. A retrievable well tool for use in well bores, said retrievable well tool comprising:

a first mandrel having at least one shaped recess in one end thereof;

a packer mandrel having a plurality of apertures therein, at least one lug extending inwardly therefrom to engage the shaped recess in the first mandrel and ratchet grooves on a portion thereof;

a ratchet body having a portion thereof adapted to releasably engage the ratchet grooves on the packer mandrel, the ratchet body being disposed about the packer mandrel;

a packer element disposed about the packer mandrel, the packer element adapted to releasably, resiliently engage said well bore;

a packer mandrel case disposed about a portion of the packer mandrel;

an upper wedge member disposed about the packer mandrel and having a frusto-conical surface on a portion of the exterior thereof;

a lower wedge member disposed about a portion of the packer mandrel having a frusto-conical surface on a portion of the exterior thereof; and

a plurality of slips disposed about a portion of the packer mandrel being axially located between the upper wedge member and the lower wedge member.

4,648,447

CASING SCRAPER

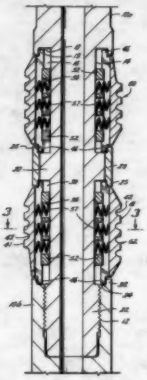
Thomas R. Bishop; Archie W. Peil, and Arnal B. Foreman, Jr., all of Houston, Tex., assignors to Bowen Tools, Inc., Houston, Tex.

Filed Sep. 11, 1985, Ser. No. 774,890

Int. Cl.[4] E21B *37/02*

U.S. Cl. 166—173 **13 Claims**

9. A casing scraper for scraping the interior of tubular members wherein the improvement comprises providing a plurality of cutter blades which interlock so as to form a substantially tubular cutting assembly concentric with a supporting mandrel in which an interlocking contact of corresponding longitudinally extending step portions on adjacent blades provides for radial contact between adjacent blades during radial expansion and contraction of said cutter assembly, each of said cutter



blades including a recess to receive a housing for biasing means between said cutter blades and said mandrel.

4,648,448

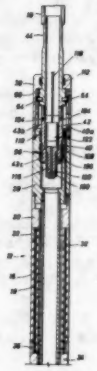
PACKER ASSEMBLY

Lawrence Sanford, Houston; Charles O. Stokley, Sugar Land, and Edwin C. Turner, Houston, all of Tex., assignors to Tam International, Inc., Houston, Tex.

Filed Dec. 20, 1984, Ser. No. 684,006

Int. Cl.[4] E21B *33/127*

U.S. Cl. 166—191 **37 Claims**



1. A downhole packer assembly, including a first packer tool, defining a central longitudinal flowway and comprising:

a flexible tubular packer body disposed generally coaxial to said central flowway and radially extendable and retractable for contact with and release from a well bore wall;

means defining a packer set chamber in pressure communicating relation with said packer body whereby said packer body may be radially extended by fluid pressure in said packer set chamber;

a generally annular packer foundation coaxially connected to the upper end of said packer body;

means defining a bypass flow system for permitting flow of fluid from said packer set chamber to said central flowway and from said central flowway radially outwardly

through said packer foundation to the exterior of said assembly;

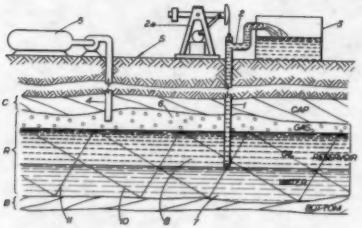
and control means adjacent said packer foundation and movable with respect to said packer foundation between a first position, for opening said bypass system, and a second position, for closing said bypass system.

4,648,449

METHOD OF OIL RECOVERY

William M. Harrison, 6666 Chimney Rock #14, Houston, Tex. 77081

Filed Aug. 12, 1985, Ser. No. 764,718
Int. Cl.[4] E21B *43/25*
U.S. Cl. 166—249 **30 Claims**



1. A method of recovering petroleum fluids from an underground reservoir comprising the steps of:

(a) injecting into said reservoir a substantially water insoluble gas;

(b) discontinuing said gas injecting;

(c) generating one or more soundwaves and directing said soundwaves into said reservoir to release petroleum fluids retained by said reservoir; and

producing said petroleum fluids through a well communicating with said reservoir.

4,648,450

METHOD OF PRODUCING SYNTHESIS GAS BY UNDERGROUND GASIFICATION OF COAL USING SPECIFIC WELL CONFIGURATION

Bruce W. Gash; Luis E. Arri; Elton B. Hunt, Jr., and David R. Parrish, all of Tulsa, Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed Nov. 27, 1985, Ser. No. 802,800
Int. Cl.[4] C10B *57/20*; E21B *43/243*
U.S. Cl. 166—259 **11 Claims**

1. A method of producing synthesis gas by the underground gasification of coal in individual noninteracting cavities formed by the gasification of the coal in a thick coal seam which is generally horizontal under an overburden and wherein loose coal and char formed from the combustion of the coal in said seam have a known angle of repose, said seam being provided with an injection well positioned at an angle with respect to the horizontal of less than the angle of repose and with a production well positioned at an angle with respect to the horizontal of greater than the angle of repose but less than 90°, the distance between said wells decreasing toward the bottom of said seam, comprising linking said wells, initiating combustion near the bottom of said seam and thereby producing a cavity in said seam, introducing an oxygen-containing gas mixture into said seam through said injection well, and removing combustion products through said production well.

4,648,451

ENHANCED OIL RECOVERY PROCESS BY INJECTING A MICELLAR SOLUTION OF SURFACTANTS HAVING A SOLUBILITY GRADIENT IN WATER

Marc Bavierè, Noisy Le Roi; Jean-Claude Moulu, Aubergenville, both of France; Tibor Paál, Nagykanizsa, Hungary; György Tiszai, Nagykanizsa, Hungary; Györgyi Gaál, Nagykanizsa, Hungary; Laszlo Schmidt, Szazhalombatta, Hungary, and Gyula Gesztesi, Budapest, Hungary, assignors to Institut Francais du Petrole, Rueil-Malmaison, France and Magyar Szenhidrogenipari Kutato-Fejleszto Intezet, Szazhalombatta, Hungary

Filed Jan. 31, 1985, Ser. No. 696,906
Claims priority, application France, Feb. 3, 1984, 84 01652
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—273 **10 Claims**

1. A process for improving the enhanced recovery of crude oil from a geological formation forming an oil reservoir, with a significant cation exchange capacity, which comprises injecting an aqueous driving fluid containing injection water into the formation through at least one injection well, after introducing into the injection well an aqueous displacement slug adapted to push the oil to at least one production well, said slug containing a micellar solution of an anionic surfactant in injection water, being adapted to exchange ions with the formation and being formed of a plurality of successively injected zones; at least some of said zones containing at least one anionic surfactant to provide a surfactant gradient concentration decreasing over a portion of the slug with the lowest concentration being at the zone last introduced into the injection well, the slug zone introduced first into the injection well containing an auxiliary agent which reduce the solubility of the anionic surfactant in the injection water and the slug zone introduced last into the injection well containing an auxiliary agent which enhances the solubility in the injection water of the anionic surfactant brought to the formation by previously injected zones of the slug to maintain the slug efficiency at an optimum value throughout the plurality of zones of the slug.

4,648,452

METHOD OF INCREASING ENHANCED OIL RECOVERY BY USING A NOVEL LOW SULFONATE PHASE IN THE POLYMER SLUG

Joseph T. Carlin, Houston, and Gilbert L. Haferkamp, Manvel, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed May 1, 1985, Ser. No. 729,451
Int. Cl.[4] E21B *43/22, 43/40*
U.S. Cl. 166—274 **14 Claims**

1. A process for enhanced hydrocarbon recovery comprising injecting into a well a surfactant fluid comprising the fraction having the highest sulfonate content which separates after settling from a mixture of water, petroleum sulfonate surfactant, solubilizer and polymer and thereafter adding the remaining fraction of surfactant fluid which contains the lower sulfonate content to a polymer slug, injecting the polymer slug and forcing said high sulfonate content surfactant slug and subsequently the low sulfonate polymer slug through the formation and recovering said hydrocarbons.

4,648,453

PROCESS FOR REMEDIAL CEMENTING

Surjit S. Nagra, and Andrew R. Strilchuk, both of Calgary, Canada, assignors to Exxon Production Research Co., Houston, Tex.

Filed Nov. 18, 1985, Ser. No. 799,072
Int. Cl.[4] E21B 33/138
U.S. Cl. 166—281 25 Claims

25. A method for plugging a zone of perforations in a cemented well casing penetrating a subterranean formation, said method comprising the steps of:

(a) injecting into said zone of perforations a hydrocarbon solvent to dissolve any asphaltenes and other accumulated hydrocarbons in said zone of perforations:

(b) injecting into said zone of perforations an acid solution adapted to dissolve mineral constituents of accumulated rock particles within and immediately surrounding said perforations;

(c) pumping cement to said zone of perforations; and

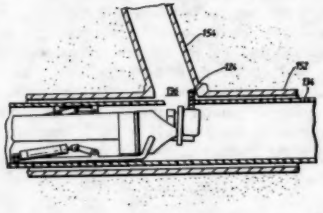
(d) forcing said cement through the perforations in said zone.

4,648,454

ROBOT

Ian R. Yarnell, Unit 106B, Blackdown Industries, Haste Hill, Haslemere, Surrey, GU27 2HA, England

PCT No. PCT/GB83/00094, § 371 Date Nov. 29, 1983, § 102(e) Date Nov. 29, 1983, PCT Pub. No. WO83/03457, PCT Pub. Date Oct. 13, 1983
PCT Filed Mar. 29, 1983, Ser. No. 561,596
Claims priority, application United Kingdom, Mar. 29, 1982, 8209222; Nov. 2, 1982, 8231303
Int. Cl.[4] E21B 29/06
U.S. Cl. 166—297 8 Claims



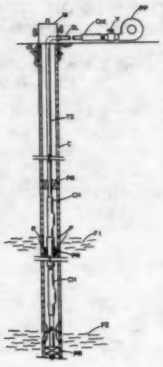
1. A remotely controllable travelling robot for operation inside a pipe or bore-hole, comprising a carriage (10, 12) for engaging the wall of the pipe or bore-hole, a support structure (14, 16) mounted on the carriage (10, 12), and a tool mounting assembly (22) carried by the support structure and rotatable relative to the support structure by remote control about a longitudinal axis, wherein the support structure (14, 16) is movable by remote control relative to the carriage 10, 12) to vary the position of the said longitudinal axis of rotation relative to the carriage, wherein said tool mounting assembly (22) is housed at a front end of the support structure (14, 16) and wherein a rear end portion of the support structure is pivotally mounted on a rear end portion of the carriage (10, 12), a front end portion of the support structure being supported on the carriage by an elevator mechanism (32-40) for elevating the tool mounting assembly (22), and so varying the position of the said longitudinal axis of rotation relative to the carriage (10, 12).

4,648,455

METHOD AND APPARATUS FOR STEAM INJECTION IN SUBTERRANEAN WELLS

Mike A. Luke, Pasadena, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Apr. 16, 1986, Ser. No. 852,571
Int. Cl.[4] E21B 43/24
U.S. Cl. 166—303 24 Claims



1. A method of injecting steam at a selected mass flow rate into a production formation of a subterranean well having a tubing string traversing the production formation comprising the steps of:

supplying a steam flow to the surface end of the tubing string;

diverting the downwardly flowing steam into two radially separated flow components above and adjacent to the production formation;

directing one of said flow components into the inlet end of a Venturi passage, the outlet end of the Venturi passage being in communication with the production formation; and accelerating the flow rate of said one flow component by said Venturi passage to its critical mass flow rate.

10. Apparatus for injecting steam into a production formation of a subterranean well at a selected mass flow rate comprising a tubular housing connectable in series relationship to the tubing string adjacent the production formation; fluid diverting means in said tubular housing for dividing the steam flow into two radially separated components; and means including a Venturi passage for accelerating the flow rate of one said flow component to the critical mass flow rate and directing the accelerated component to the production formation.

4,648,456

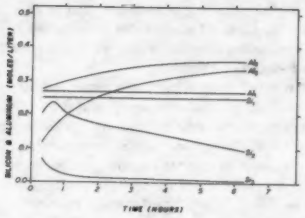
METHOD FOR ACIDIZING SILICEOUS FORMATIONS

Walter J. Lamb, The Woodlands, and Kenneth R. Kunze, Houston, both of Tex., assignors to Exxon Production Research Co., Houston, Tex.

Filed Jul. 1, 1985, Ser. No. 750,804
Int. Cl.[4] E21B 43/27
U.S. Cl. 166—307 11 Claims

1. A method for treating a subterranean formation surrounding a wellbore which comprises injecting into said formation an aqueous acidizing solution, said aqueous acidizing solution

containing hydrofluoric acid and excess fluoride, said excess fluoride present in an amount greater than the amount of fluoride stoichiometrically required to form hydrofluoric acid, and thereafter producing fluids from said wellbore.

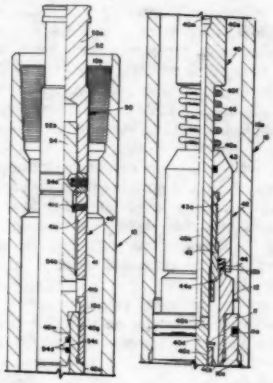


4,648,457

INJECTION CONTROL DEVICE FOR SUBTERRANEAN WELL CONDUIT

Richard J. Ross, and Joseph N. Klumpyan, both of Houston, Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.

Filed Oct. 24, 1985, Ser. No. 790,876
Int. Cl.[4] E21B *34/12*
U.S. Cl. 166—332 **15 Claims**



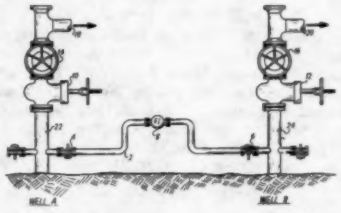
1. Valving mechanism for a well conduit communicating with a downhole tool comprising a hollow valve housing connected in series relationship with the well conduit; a slip joint connected in series relationship with the well conduit intermediate said hollow valve housing and the downhole tool; whereby said hollow valve housing may be shifted axially by the well conduit without moving the downhole tool; a first annular valve element sealingly mounted within the bore of said hollow valve housing and axially shiftable with said valve housing; a support rod insertable within the bore of said hollow valve housing to define an annular fluid passage therebetween; a second annular valve element sealingly mounted on the exterior of said support rod, whereby axial movement of said valve housing in one direction moves said first and second valve elements into axially abutting engagement to close said annular fluid passage, thereby preventing fluid flow through the conduit to the downhole tool, and axial movement of said valve housing in the opposite direction axially separates said first and second valving elements and permits fluid flow from the conduit to the downhole tool.

4,648,458

PROCESS FOR ELIMINATING STATIC VENTING OF VAPOR-DOMINATED GEOTHERMAL WELLS

John G. Brosdus, Los Angeles, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Jun. 28, 1985, Ser. No. 750,328
Int. Cl.[4] E21B *43/12, 47/00*
U.S. Cl. 166—370 **19 Claims**



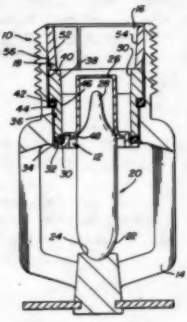
1. A method for preventing condensation of fluids in the wellbores of geothermal wells penetrating a vapor-dominated geothermal formation under conditions of well shut-in, said method comprising continuously flowing a sufficient interwell flow of geothermal vapors from at least one wellhead at higher pressure into at least one wellhead at lower pressure so as to prevent accumulation of condensate and non-condensable vapors in all the wellheads connected by said interwell flow.

4,648,459

LOW PRELOAD SELF-SEALING QUICK RELEASE VALVE FOR SPRINKLER HEAD

George S. Pieczykolan, North Wales, Pa., assignor to Central Sprinkler Corporation, Lansdale, Pa.

Filed Oct. 30, 1985, Ser. No. 793,030
Int. Cl.[4] A62C *37/14*
U.S. Cl. 169—38 **9 Claims**



1. A quick release valve for a sprinkler head having a frame adapted to support a thermal responsive actuating element at one end, and a flow passage defined by a flow passage wall, comprising:

a saddle adapted to contact another end of the thermal responsive actuating element,

a bushing having a first surface portion adapted to face the flow passage wall and a second surface portion adapted to face the saddle,

first sealing means resiliently deformable by the bushing first surface portion for sealing the interface between the flow passage wall and the bushing first surface portion,

second sealing means resiliently deformable by the bushing

second surface portion for sealing the interface between the saddle and the bushing second surface portion,

said bushing being axially displaceable within the flow passage, and

means for axially displacing said bushing in the flow passage so as to exert a compressive preload on the thermal responsive actuating element.

4,648,460

FIRE PROTECTION SYSTEM

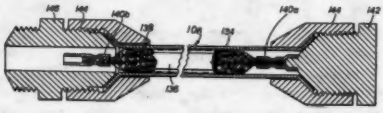
Alister L. McCulloch, Berwick, Australia, assignor to Chubb Australia Limited, New South Wales, Australia

Continuation-in-part of Ser. No. 492,997, May 9, 1983, abandoned, which is a division of Ser. No. 195,211, Oct. 7, 1980, abandoned. This application Jul. 26, 1984, Ser. No. 634,622

Claims priority, application Australia, Oct. 12, 1979, 51725/79; Jul. 26, 1983, PG0475

Int. Cl.[4] A62C *37/34*

U.S. Cl. 169—57 **3 Claims**



1. A fire detector comprising an elongate tube of heat-conductive material, a temperature-responsive element housed within the tube, said element comprising a length of a gas-evolving substance effective when a predetermined critical temperature is reached at any point along the length of the element to explosively generate a volume of gas for activating pneumatic actuation means, a mesh sheath surrounding said length of gas-evolving substance, said sheath defining a filter to retain combustion products and unburnt residue of said substance, the temperature-responsive element further comprising an end fitting at each end of the sheath, the end fitting at one end of the sheath being externally threaded and the end fitting at the other end of the sheath being internally threaded, the internal and external threads being complementary whereby two such temperature-responsive elements may be coupled by engaging the externally-threaded end fitting of one of said elements with the internally-threaded end fitting of the other of said elements.

4,648,461

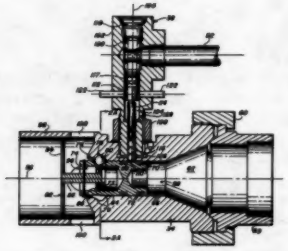
FLUID PRESSURE DISCHARGE SAFETY SYSTEM

Michael M. Kordich, Fredericksburg, and John W. Shea, King George, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Arlington, Va.

Filed Jul. 1, 1985, Ser. No. 749,976

Int. Cl.[4] A62G *37/00*

U.S. Cl. 169—60 **13 Claims**



1. A fluid pressure discharge safety system for detecting and suppressing opposed exhaust streams of an accidentally fired and stored missile, the missile being provided with an exhaust nozzle at its trailing end for generating one of the opposed exhaust streams and also being provided with adapter ring means that include exhaust port means disposed adjacent but spaced from the forward end of the missile, the exhaust port means for generating the other one of the opposed exhaust streams, said system comprising:

first nozzle spray means having interior surface means between its fluid pressure discharge and inlet ends such that the surface means defines the longitudinal bore therebetween, the discharge end of the first nozzle spray means being disposed in operative and spaced relation to the exhaust nozzle of a stored missile, the first nozzle spray means having an aperture interposed between its ends and in direct open communication with the bore,

second nozzle spray means disposed in operative and spaced relation to the exhaust port means of the adapter ring means of the stored missile,

fluid pressure responsive plug means being insertable and slidably connectable in the bore of the first nozzle spary means at the discharge end thereof and also being ejectable from the discharge end thereof, said plug means having an open end chamber at the outer end thereof,

missile nozzle exhaust stream detection means having plunger means, said plunger means being inserted in the chamber of the plug means and slidably connected to the plug means in the chamber thereof,

recess means provided in the interior surface means of the first nozzle spray means and arranged in communication with the bore,

a plurality of relatively spaced radial passageway means provided in the plug means, each of the radial passageway means being in direct open comunication between the chamber of the plug means and the exterior thereof,

a series of locking ball means, each one of the locking ball means being inserted in its associated passageway means of the plug means and also in the recess means of the first nozzle spray means when the plug means is in its inserted position in the bore of the first nozzle means,

the plunger means being positionable in the chamber of the plug means in order to cover all of the radial passageway means so as to initially hold each inserted locking ball means of the series of locking ball means between the recess means and its associated radial passageway means of the plurality thereof,

frangible locking pin means extending between said plug means and said detection means in order not only to firmly secure the plunger means in a position for covering the plurality of radial passage way means but also to firmly hold each inserted locking ball means of the series of locking ball means between the recess means of the first nozzle spray means and its associated passageway means of the plurality of the plug means thereby releasably securing the plug means in its inserted position in the bore of said first nozzle spray means so as to prevent discharge of pressure fluid therefrom,

first valve means having an opening therein, said first valve means being connected to the first nozzle spray means such that one end of the opening is arranged in open fluid intercommunication between the aperture of the first nozzle spray means and the bore thereof when the aperture is not covered by the plug means in its inserted position in the bore of said first nozzle means,

second valve means connected to the second nozzle spray means, the second valve means for controlling the operation of the second nozzle spray means for discharging a spray of pressure fluid from said source means,

fluid pressure source means having branch conduit means connected to each inlet of the first and second nozzle spray means, said fluid pressure source means also having other conduit means parallel connected to the first and second valve means, said first valve means having bleed

port means, the port means being in open fluid communication with the opening between its ends,

valve spool means slidably mounted in the opening of the first valve means for reciprocal movement between its ends, the valve spool means having stem means for engaging the plug means when the plug means is in its inserted position in the bore of the first nozzle spray means, the stem means being advanceable through the aperture when the plug means is ejected from the first nozzle spray means,

said other conduit means being connected to the other end of the opening of first said valve means, the fluid pressure source means of said other conduit means for continuously and biasingly urging the valve spool means and stem means in a direction toward the one end of the opening in order that the stem means is maintained in engagement with the plug means so as to hold the valve spool means in a position for closing off fluid communication between the port means and the other conduit means upon the plug means being in its inserted position in the bore of the first nozzle spray means, and

said detection means having missile exhaust stream impact means for detecting the existence of a missile exhaust stream when the propellant of a missile associated with said detection means is ignited and then the ignited propellant causes the formation of an exhaust stream that is emitted from the trailing end of the missile which impacts said impact means and causes advancement of said detection means relative to said plug means upon fracture of said pin means while at the same time the advanced detection means causes release of each inserted locking ball means of said series of locking ball means from its associated radial passageway means of said plug means and the recess means of said first nozzle spray means into the chamber in order to effect ejection of the plug means from the discharge end of the first nozzle spray means and discharge of a continuous spray of pressure fluid from the first nozzle spray means to fully encompass the exhaust stream about the missile axis at its trailing end so as to form a fluid pressure safety shield thereabout; and also at the same time, as the result of the plug means being ejected from the first nozzle spray means, the valve spool means and stem means are advanced in a direction towards the bore of the first nozzle spray means in order to interconnect the other conduit means and the port means thereby causing a reduction in the pressure of the pressure fluid in the other conduit means so that the second valve means is opened and the second nozzle spray means discharges pressure fluid that forms a continuous fluid pressure spray in a direction about the missile axis at its port means exhaust stream so as to form another fluid pressure safety shield about the port means exhaust stream.

4,648,462

AUTOMATIC FIRE EXTINGUISHER WITH INFRARED RAY RESPONSIVE TYPE FIRE DETECTOR

Takashi Odashima, Mitaka, Japan, assignor to Tekken Construction Co., Ltd., Tokyo, Japan

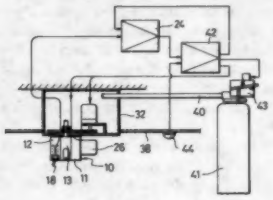
Filed Jan. 8, 1986, Ser. No. 817,091

Claims priority, application United Kingdom, Apr. 23, 1985, 8510357

Int. Cl.[4] A62C *37/02*

U.S. Cl. 169—61 **11 Claims**

1. An automatic fire extinguisher comprising a fire detector including a plurality of light receiving elements, an assembly of an infrared-ray-passing filter and a condenser for receiving infrared rays at one of said light receiving elements which corresponds to an incident angle of said infrared rays, and means for unifying received incident infrared ray amount from fire flames occurring at any position in a detection area of said detector to be substantially constant so long as the magnitude of said flames is the same; a fire extinguishant tank; an ejection nozzle communicating with said tank; means for processing a detection output signal of said fire detector; means responsive to an output of said signal processing means for directing said



ejection nozzle towards a position of detected fire flames; and means responsive to an output of said signal processing means for opening said tank.

4,648,463

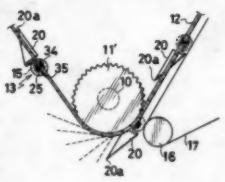
WEEDER FOR REMOVING WEEDS HAVING VARIOUS LENGTHS

Sugiyama Toshiichi, No. 25-25, Fujioka 5-chome, Fujieda, Shizuoka, Japan (426)

Filed Oct. 15, 1984, Ser. No. 661,174

Int. Cl.[4] A01D *45/00, 45/30, 46/18*

U.S. Cl. 171—61 **12 Claims**



1. A weeder comprising:

a body movable along a ground surface;

a weeding unit having a plurality of first rotatable members, a first winding transmission member having a substantial width and being looped around said plurality of first rotatable members, and weed fetch rods arranged on said first winding transmission member at predetermined intervals and movable in unison with said first winding transmission member;

a drive unit for driving said first winding transmission member;

a gripping unit provided next to said weeding unit transverse to a direction in which said body is moved, said gripping unit having a plurality of second rotatable members, and a second winding transmission member having a substantial width and being looped around said plurality of second rotatable members;

said first and second rotatable members including a lowest first rotatable member and a lower second rotatable member, respectively, which are operatively located in a plane extending substantially parallel to and in the vicinity of the ground surface and next to one another in a direction in which said body of said weeder is moved, so as to define a transverse lowest contact line between said weeding unit and said gripping unit as a start line of a contact start plane;

said first rotatable members including an upper rotatable member separated from said lowest first rotatable member in a vertical direction of said body, said first winding transmission member and said weed fetch rods movable in

unison therewith and being rectilineraly movable between said lowest and upper first rotatable members;

said second rotatable members including an upper rotatable member separated from said lowest second rotatable member in a vertical direction of said body, said second winding transmission member being rectilinearly movable between said lowest and upper second rotatable members in parallel with said first winding transmission member, said second winding transmission having an outer surface provided so as to be in forced contact with said weed fetch rods; and

said weed fetch rods having an outer peripheral surface; each of said weed fetch rods of said weeding unit carries a series of cutting blades arranged in a comb-like manner, the top of each of said cutting blades lying inwardly of the outermost portion of the outer peripheral surface of said each of said weed fetch rods when said each of said weed fetch rods is rectilinearly moved, and the top of said each of said cutting blades lying outwardly of the outermost portion of the outer peripheral surface of said each of said weed fetch rods when said each of said weed fetch rods is moved along an arcuated locus.

4,648,464

CULTIVATING TOOL

Edward J. Huxley, Spennymoor, England, assignor to Black & Decker Inc., Newark, Del.

Filed Jul. 3, 1985, Ser. No. 752,505

Claims priority, application United Kingdom, Jul. 5, 1984, 8417124

Int. Cl.[4] A01D *34/10*; A01B *79/00, 1/10*

U.S. Cl. 172—36 **13 Claims**

13. A soil working tool, comprising:

a housing having a base at the bottom thereof for supporting the tool on soil to be worked;

a pair of superimposed, oppositely reciprocating, plate-like blades pivotally mounted in said housing and extending downwardly and forwardly out of said housing;

forward operating ends of said blades forwardly penetrating into the soil at an acute angle to the surface of the soil when said tool is supported thereon by said base, said operating ends reciprocating in adjacent parallel planes which make the same acute angle with said surface;

an elongate stem connected to and extending rearwardly and upwardly from said housing and having at an upper end a handle for manipulation of said tool on the soil;

an electric motor mounted in said housing and having a drive shaft disposed transversely to said base;

a transmission drivingly connected between said motor and said blades for reciprocating said blades about a common pivotal axis;

said transmission comprising the drive shaft of said motor meshing with a gear rotatably mounted in said housing, two cams fixed to said gear for rotation therewith about a common rotational axis, and an elongate aperture in a rear portion of each blade and in which a respective one of said cams rotatably engages;

said cams being superimposed upon each other, being disposed to one side of said gear, and being disposed eccentrically to opposite sides of said common rotational axis; and

said common rotational axis, said common pivotal axis and said drive shaft being parallel to each other with said common rotational axis being disposed between said common pivotal axis and said drive shaft.

4,648,465

RESILIENTLY MOUNTED EARTH SMOOTHING ROLLER

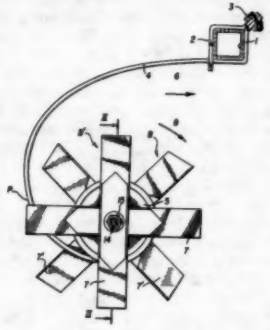
Finn U. H. Jensen, Vemmelev, Denmark, assignor to Kongskilde Koncernselskab A/S, Soro, Denmark

Filed Aug. 14, 1984, Ser. No. 640,571

Claims priority, application Denmark, Aug. 22, 1983, 3829/83

Int. Cl.[4] A01B *21/04, 35/28*

U.S. Cl. 172—551 **1 Claim**



1. An implement for working the surface of an agricultural field containing plant remains, comprising:

a frame member extending generally transverse to the normal direction of travel of the implement;

a plurality of hub structures each carrying a plurality of circumferentially spaced earth engaging knives extending radially therefrom, means rotatably supporting said knives relative said hub structure;

arms mounted on said frame member and supporting said hub structures beneath said frame member, each of said arms extending rearwardly from said frame member and being curved downwardly and thence forwardly directed to a point engaging the bottom-most periphery of one respective said hub structure,

whereby that portion of each of said arms immediately adjacent said hub structure prevents the accumulation of plant remains that can block the rotation of said knives as plant remains are driven rearwardly and upwardly by said knives and strike said downwardly curved and forwardly directed arm, and

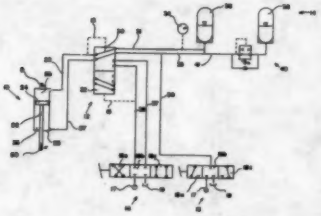
each arm is a curved spring member.

4,648,466

FURROW OPENER OPERATING APPARATUS

Christopher J. Baker, and Craig D. Kernohan, both of Massey University, Palmerston North, New Zealand

Filed Jun. 10, 1985, Ser. No. 742,809
Claims priority, application Netherlands, Jun. 13, 1984, 208492; Jul. 18, 1984, 208936
Int. Cl.[4] A01B *61/04*; F16D *31/02*; F15B *11/00, 13/00*
U.S. Cl. 172—260.5 18 Claims



1. Apparatus for operating a ground engaging implement, the implement being mounted on a drag arm that is pivotally connected to a support means, the operating apparatus comprising:

double acting hydraulic cylinder means having thrust and draw sides and first and second ends, the first end being adapted to connect the cylinder means to the drag arm, the second end being adapted to connect the cylinder means to the support means; and

a hydraulic circuit, including

(i) a first section including a source of pressurized fluid and fluid reservoir,

(ii) a second section including pressure absorption means,

(iii) a mode selection valve having a first position to connect the cylinder means hydraulically to the first section and to disconnect the cylinder means hydraulically from the second section, and a second position to connect the cylinder means hydraulically to the second section and to disconnect the cylinder means hydraulically from the first section,

(iv) conducting means connecting the mode selection valve to the first section to conduct hydraulic fluid therebetween, connecting the mode selection valve to the second section to conduct hydraulic fluid therebetween, and connecting the mode selection valve to the thrust and draw sides of the cylinder means to conduct fluid between the mode selection valve and the thrust and draw sides,

(v) the first section further including first and second control valves,

the first control valve having a first position to conduct fluid, when the mode selection valve is in its first position, from the source of pressurized fluid to the thrust side of the cylinder mewns and from the draw side of the cylinder means to the reservoir to extend the cylinder means,

the first control valve further having a second position to conduct fluid, when the mode selection valve is in its first position, from the source of pressurized fluid to the draw side of the cylinder means and from the thrust side of the cylinder means to the reservoir to retract the cylinder means,

when the mode selection valve is in its second position, the thrust and draw sides of the cylinder means are connected to the second section, and said second section is adpated to dampen forces transmitted through the cylinder means from the ground engaging implement, and maintains a substantially constant pressure on the thrust and draw sides of the cylinder means, and the cylinder means is adapted to apply a substantially constant net force on the ground engaging implement,

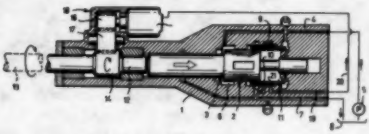
the second control valve having a first position to conduct fluid from the source of pressurized fluid to the second section to increase the pressure therein, and having a second position to vent hydraulic fluid to the reservoir from the second section to decrease the pressure therein.

4,648,467

PRESSURE FLUID OPERATED PERCUSSION DRILLING MACHINE PROVIDED WITH A ROTATION MECHANISM

Unto Ahtola, and Jaakko Kuusento, both of Tampere, Finland, assignors to Oy Tampella Ab, Tampere, Finland

Filed Oct. 16, 1984, Ser. No. 661,563
Claims priority, application Finland, Oct. 28, 1983, 833962
Int. Cl.[4] B25D *9/20*
U.S. Cl. 173—107 4 Claims



1. A pressurized fluid operated percussion drilling machine comprising

a frame forming a cylinder space for slidable engagement with a percussion piston,

the percussion piston movable axially in the cylinder space in return and percussion directions,

an inlet channel and a first outlet channel located within the frame, the inlet channel and the first outlet channel being connectable to a pressurized fluid source and to a pressurized fluid container respectively to move the percussion piston in the return and the percussion directions by means of the pressurized fluid,

a distributing valve adapted for controlling movement of the piston, the distributing valve axially movable in a space being independent from the cylinder space,

means for attaching a drilling rod to the frame positioned as an extension of the cylinder space,

a pressurized fluid operated rotational mechanism for rotating the drilling rod, said rotational mechanism being connectable to said cylinder space through a second outlet channel for rotating the rotational mechanism by means of the pressurized fluid discharging from said cylinder space,

said cylinder space being divided by the movable percussion piston on two chambers, a first chamber being adjacent to said means for attaching the drilling rod to the frame and to one side of the movable percussion piston, a second chamber being defined by the other end of the movable percussion piston and a rear end of the frame,

the first and the second outlet channels terminating in the second chamber, the second outlet channel being positioned in the second chamber at a predetermined distance from the first outlet channel in the return direction of the movement of the percussion piston.

4,648,468

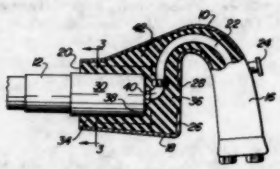
PORTABLE POWERED TOOL WITH VIBRATION DAMPING

Thomas S. Honsa, East Moline, Ill., assignor to Honsa Technologies, Moline, Ill.

Filed Jun. 26, 1985, Ser. No. 749,154
Int. Cl.[4] B25D *9/04*
U.S. Cl. 173—139 6 Claims

1. A portable, powered hand-held tool of the type generating vibration in operation and having a rigid handle and a separate, rigid fore-and-aft barrel including a rear part adjacent to the handle and a front part rigidly related to the rear part and adapted to receive a work-performing element, character-

ized in that the rear part is of generally cylindrical section on the fore-and-aft axis of the barrel and has a peripheral outer surface and also a rear end generally radial surface facing toward the handle, the handle includes rigid therewith a forwardly projecting cup-like extension substantially coaxial with the rear barrel part and opening forwardly to receive and loosely surround said rear part, said extension including an interior peripheral wall surface of greater diameter than the



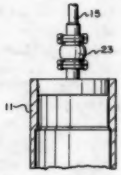
rear barrel part and combining with the exterior surface of said part to form an annular space, said extension further including rigid therewith a rear, generally radial wall providing an interior front surface spaced rearwardly of the rear surface of the barrel to provide a further space contiguous with the annular space, and a filling of shock-absorbing elastomer material is contained within and fills said spaces and is adhered to the interior surfaces of the extension and to the extension-surrounded surfaces of the barrel.

4,648,469

ALLEVIATING VORTEX SHEDDING STRESS PROBLEMS

Michael D. Biggs, and Frank J. Schuh, both of Plano, Tex., assignors to Atlantic Richfield Company, Plano, Tex.

Filed Sep. 24, 1985, Ser. No. 779,415
Int. Cl.[4] E21B *7/12*
U.S. Cl. 175—7 **3 Claims**



1. In a method of lowering and jetting-in a surface string in deep water having a current and consisting essentially of:

a. suspending the surface string of conduit from a smaller diameter conduit;

b. circulating jetting-in fluid downwardly from a floating drilling rig through said smaller diameter conduit and said surface string of conduit and an internal jet assembly therewithin and selected therefor; and

c. allowing the jetting action and the weight of said surface string of conduit to emplace said surface string of conduit to a predetermined desired depth in the earth formations at the bottom of the deep water;

The improvement comprising:

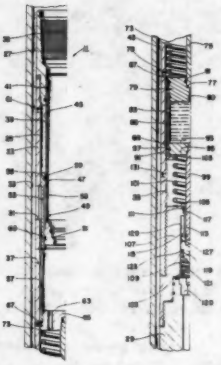
d. placing a moment reducing device in said smaller diameter conduit near its connection with said surface string so as to reduce bending stress to a non-fatigue failure level, said bending stress being caused by vortex shedding vibration modes on said surface string while suspended during the lowering and jetting-in.

4,648,470

FIRING HEAD FOR A TUBING CONVEYED PERFORATING GUN

Louis M. Gambertoglio, The Woodlands, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed May 30, 1986, Ser. No. 868,966
Int. Cl.[4] E21B *43/117*
U.S. Cl. 175—4.54 **8 Claims**



1. A firing head for a tubing conveyed perforating gun of the type which uses a firing pin to strike an explosive charge to perforate a well bore for production of well bore fluids, comprising:

a tubular sub having an interior bore and oppositely disposed connecting ends for connection in a well pipe string;

a firing pin contained within said interior bore and initially restrained by a firing pin holder;

biasing means normally biasing said firing pin in a direction away from said explosive charge upon the release of said firing pin holder;

hydraulic delay means contained within said interior bore and actuable by a pressure change within said sub interior bore from the well surface to move said firing pin holder out of locking engagement with said firing pin to release said firing pin after a predetermined time interval, said hydraulic delay means including a fluid piston located within a fluid chamber and a means for evacuating said chamber; and

port means in said tubular sub communicating hydrostatic pressure of the well, by means of an interior passage, with said firing pin to propel said firing pin toward said explosive charge.

4,648,471

CONTROL SYSTEM FOR BOREHOLE TOOLS

Ernesto E. Bordon, Houston, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

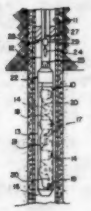
Filed Nov. 2, 1983, Ser. No. 548,109
The portion of the term of this patent subsequent to Jul. 9, 2002, has been disclaimed.
Int. Cl.[4] E21B *43/116*
U.S. Cl. 175—4.55 **14 Claims**

1. A control assembly for use with a tool including one or more subassemblies adapted for controlling and/or monitoring various events within a borehole and actuating instrumentation positioned on the earth's surface for actuating said tool, comprising:

control means connected to the tool for selectively actuating one or more of the subassemblies within the tool, said control means being adapted for operation within the borehole,

power supply means connected to the tool for supplying electrical power to said control means for operation thereof independent of the surface actuating instrumentation,

communication means connected to the surface actuating instrumentation for communicating therewith, and



connection means for selectively connecting said communication means to said control means while the tool and said control means connected thereto are within the borehole to establish communication between said control means and the surface actuating instrumentation, said connection means being adapted for operation within the borehole.

4,648,472

TRACTOR FOR AGRICULTURAL PURPOSES

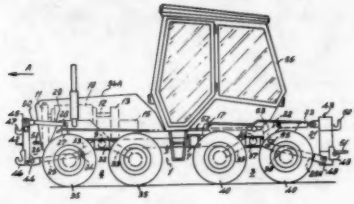
Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Continuation of Ser. No. 468,382, Feb. 22, 1983, Pat. No. 4,523,656. This application Mar. 25, 1985, Ser. No. 715,208

Claims priority, application Netherlands, Feb. 19, 1982, 8200663

Int. Cl.⁴ B60K *17/34*

U.S. Cl. 180—24 **13 Claims**



1. A lightweight agricultural tractor having a relatively high power-to-weight ratio for seedbed preparation which comprises: an engine having power in a range of about thirty to sixty kilowatts and transmission means powered by said engine, said transmission means comprising at least one steel gear box housing; a frame composed in major part of hollow beams carrying said engine; a lifting device including coupling points connected to one end of said frame, the length of said tractor measured from said coupling points to the other end of said tractor being about five meters; and a set of front wheels and a set of rear wheels which are mounted to and support said frame, wheel supports pivotally attached to said frame and interconnecting said wheels in both said sets to said frame so that all of said wheels are freely pivotable upwardly and downwardly within limits relative to said frame and the portion of the weight of the tractor borne by each said wheel in each said set is about the same, at least one of said sets of said wheels driven by said engine via said transmission means, and at least four of said wheels comprising low pressure pneumatic tires each having diameters of about one meter and widths substantially about forty percent of their respective diameters, and a ground contact surface area of about said width squared so that the weight of the tractor on said contact surface area of each said tire is such that it does not adversely compact the soil when used for seedbed preparation.

4,648,473

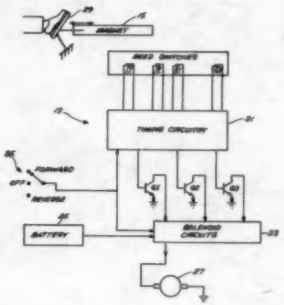
SPEED CONTROL FOR AN ELECTRIC GOLF CAR

William J. Bergner, Memphis, Tenn., assignor to Columbia Parcar Corporation, Deerfield, Ill.

Filed May 8, 1985, Ser. No. 731,946

Int. Cl.⁴ B60K *1/00*

U.S. Cl. 180—65.8 **5 Claims**



1. A speed control for an electric motor of a golf car providing sequential changing between at least three separate speeds such that the golf car must accelerate through separate fixed speeds for predetermined times prior to reaching a full speed, comprising:

a foot pedal depressable by an operator of the golf car to different extents for indicating desired relative speed;

a plurality of switches, each of said switches being actuable in response to a predetermined extent of depression of said foot pedal, said plurality of switches generating an electrical indication of a desired relative speed;

timing circuitry including three output conductors for carrying motor drive signals, said timing circuitry being responsive to a said electrical indication of said switches for generating a sequence of motor drive signals along said output conductors, said timing circuitry generating motor drive signals in succession at predetermined times along said output conductors in response to the extent of depression of said foot pedal for driving the motor at fixed speeds for predetermined times prior to reaching said desired relative speed; and

motor drive means connected to said output conductors and responsive to said motor drive signals for actuating said motor at different speeds.

4,648,474

AIR CLEANER SYSTEM FOR MOTORCYCLES

Takashi Shinozaki, and Satoshi Ishikawa, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1983, Ser. No. 536,245

Claims priority, application Japan, Sep. 29, 1982, 57-170216; Sep. 29, 1982, 57-170214; Sep. 29, 1982, 57-170213; Sep. 29, 1982, 57-170217

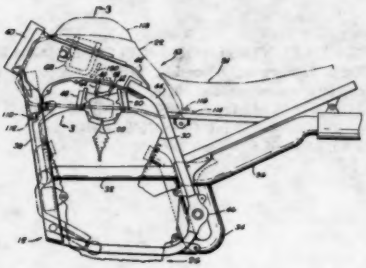
Int. Cl.⁴ B60K *11/06, 13/02, 15/02*

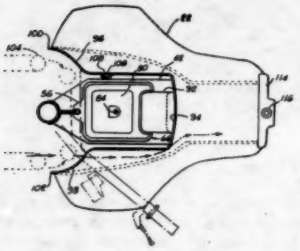
U.S. Cl. 180—219 **14 Claims**

1. A motorcycle comprising

a frame including a main frame member of hollow construction forming an enclosed cavity having an inlet opening through the upper side thereof;

a fuel tank positioned on said main frame member and having a U-shaped cavity facing forwardly on the motorcycle





to extend around said opening in said main frame member; and

an air cleaner assembly positioned in said inlet opening.

4,648,475

TRANSMISSION UNIT FOR A VEHICLE WITH A TRANSVERSE ENGINE AND HALF-SHAFTS OF EQUAL LENGTH, HAVING AN INTERMEDIATE SHAFT PROVIDED WITH A RESILIENT SUPPORT

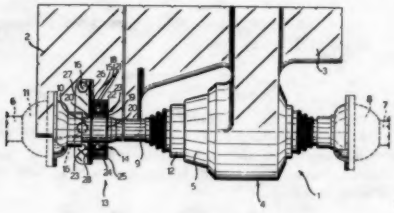
Bartolomeo Veglia, Turin, Italy, assignor to RIV-SKF Officine di Villar Perosa S.p.A., Turin, Italy

Filed Mar. 15, 1984, Ser. No. 590,076

Claims priority, application Italy, Mar. 17, 1983, 53070/83[U]

Int. Cl.[4] B60K 5/04

U.S. Cl. 180—297 **3 Claims**



1. A transmission unit for a vehicle provided with a transverse engine, said unit including a gear box mounted along side said engine, a differential supported beneath said gear box and connected to first and second half-shafts having the same length and connectable to the wheels of the vehicle by means of respective ball joints, an intermediate shaft connected to said first half-shaft and to said differential, and a support provided near said first half-shaft which can be fixed beneath said engine, said support comprising a rolling element bearing which is provided with an inner ring fixed to said intermediate shaft, an outer ring, and a plurality of rolling elements interposed between the inner ring and the outer ring, a casing housing said bearing and adapted to be fixed to said engine, said casing being formed of at least one layer of pressed sheet metal, and a resiliently deformable elastomeric intermediate sleeve connecting said casing and said outer ring, said elastomeric sleeve being vulcanized to said casing and said outer ring to form an integral unit, said elastomeric sleeve compensating for misalignment of the intermediate shaft with respect to the axis of said casing without overloading said bearing, and acting to damp vibrations transmitted between said engine and said intermediate shaft.

4,648,476

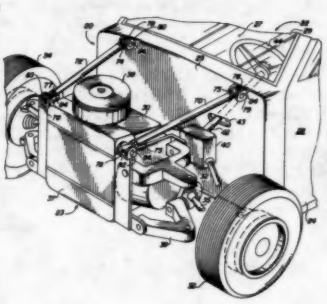
MOTOR VEHICLE

Douglas A. Roe, 4025 E. Winslow, Phoenix, Ariz. 85040, and Terance D. Harp, Phoenix, Ariz., assignors to Douglas Roe, Phoenix, Ariz.

Filed Jan. 23, 1985, Ser. No. 694,120

Int. Cl.[4] B60K 5/12

U.S. Cl. 180—297 **10 Claims**



1. A vehicle for self-propelled travel over the ground and for increased efficiency while executing an inherently unstable maneuver such as turning, said vehicle comprising:

a. a chassis having a forward end including

i. a body, and

ii. wheel means for supporting said body above the ground;

b. a drive unit having a forward end and a rearward end and including:

i. a pair of laterally spaced steerable wheels for contacting the ground, said steerable wheels having a normal axis of rotation and

ii. power means for imparting rotation to at least one of said pair of steerable wheels; and

c. coupling means for securing said drive unit to said chassis and for substantially equalizing the contribution of each of said pair of steerable wheels in directing and propelling said vehicle, said coupling means including:

i. connection means pivotally joining said drive unit to said chassis forwardly of said body;

ii. a first strut laterally spaced from said connection means and extending between said chassis and said drive unit;

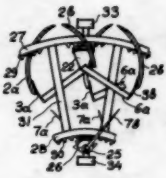
iii. a second strut laterally spaced from said connection means in a direction opposite from said lateral spacing of said first strut and extending between said chassis and said drive unit, each said strut having a first end movably affixed to said chassis and a second end movably affixed to said drive unit, the second end of each of said struts being affixed to said drive unit at a location spaced above and forward of the normal axis of rotation of said pair of steerable wheels.

4,648,477

AUTOMATIC TRANSMISSION

Usher Meyman, 230 Ocean Pkwy., Brooklyn, N.Y. 11234

Filed Sep. 26, 1983, Ser. No. 535,745
Int. Cl.[4] B60K 7/00
U.S. Cl. 180—308 4 Claims



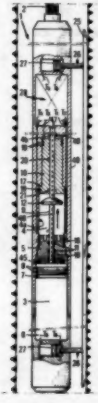
1. An automatic transmission, comprising a plurality of wheel members each having discs defining an inner space therebetween; a plurality of turnable blades and a plurality of vane members located in said inner space between the discs of at least one of said wheel members, said turnable blades being mechanically connected with said vane members, each of said turnable blades having an inner surface and an outer surface formed by circular cylindrical surfaces having a common axis, each of said turnable blades being turnable about said common axis of the circular cylindrical surfaces forming the inner and outer surfaces of the respective blade; a plurality of levers turnable about said axes and supporting said blades, said discs having a plurality of openings extending coaxially with the surfaces which describe said blades, said blades being partially received in said openings of said discs; and a housing accommodating said wheel members and said turnable blades and said vane members.

4,648,478

DEVICE FOR GENERATING SOUND PULSES INSIDE A WELL, BY PERCUSSION

Pascal Dedole, Rueil-Malmaison; Pierre Grolet, Orgerus, and Jean Laurent, Orgeval, all of France, assignors to Institut Francais du Petrol, Rueil-Malmaison, France

Filed Jan. 23, 1985, Ser. No. 694,053
Claims priority, application France, Jan. 23, 1984, 84 01094
Int. Cl.[4] G01V 1/00, 1/04, 1/40
U.S. Cl. 181—106 9 Claims



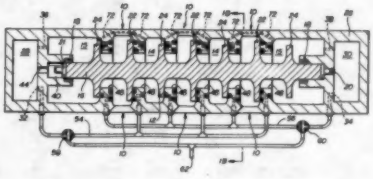
1. A device for generating sound waves in a well, by a mass striking a target element mechanically coupled to a wall of the well, the device comprising a rigid elongate body having a cross section less than a cross-section of the well and connected by a cable to a surface installation, said rigid body comprising two coaxial chambers isolated from each other by a fixed intermediate piece, a first one of the two chambers comprising an opening at an end opposite the intermediate piece, a mobile mass adapted for sealingly sliding inside the first chamber between a first position towards the end thereof having said opening and a second position in contact with said intermediate piece, said mobile mass being integral with a valve adapted for moving in said second chamber and for coming to bear against a seat formed in the intermediate piece, in the first position of said mobile mass, an operating piston adapted for sealingly sliding inside said second chamber, on a side of the valve opposite said intermediate piece and having a stroke greater than a stroke of said mobile mass between first and second positions thereof, said device further comprising a cavity isolated from the environment outside the rigid body and communicating with the first chamber through said opening, said cavity comprising means for exerting on the mobile mass a drive force independent of a static pressure existing in the well, and means for immobilizing said body in the well comprising at least one longitudinal shoe extending parallel to the body, said shoe being movable between a retracted position along said body and a spread out position coupled with the wall of the well, under an action of at least one hydraulic jack, a hydraulic system comprising a plurality of switching means controlled by said cable and motor means supplied through said cable for providing both movement of the mobile mass toward its first position, intermittent maintenance thereof in its first position and operation of said hydraulic jack.

4,648,479

MULTIPLE-PORT, MULTIPLE-CHAMBER, TUNED AIR-POWERED SUBSEA SEISMIC SOURCE

George A. Dolengowski, Stafford, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Sep. 30, 1983, Ser. No. 537,771
Int. Cl.[4] G01V 1/137, 1/38
U.S. Cl. 181—120 7 Claims



1. A seismic cource suitable for producing a seismic wave in a liquid, said seismic source comprising:

(a) a housing having a generally tubular body, two longitudinal ends, and a longitudinal axis, said tubular body having an inner side;

(b) a plurality of cylinder walls extending inwardly from said inner side of said tubular body, said cylinder walls being axially spaced along said longitudinal axis between said longitudinal ends so as to define a plurality of longitudinally spaced chambers in said housing, said chambers comprising, alternatively, pressure chambers and port chambers such that each port chamber is located between two pressure chambers, each of said cylinder walls having a port chamber side, a pressure chamber side, and a central bore therethough, said central bore being substantially co-axial with said longitudinal axis;

(c) a shuttle disposed within said housing, said shuttle being axially movable through a stroke and comprising,

(i) a shuttle shaft passing loosely through said central bore in each of said cylinder walls so as to define an annular passageway around said shuttle shaft in each of said

cylinder walls, said shuttle shaft having an axis substantially coincident with said longitudinal axis and two ends, each of said ends being supported by said housing, and

(ii) a plurality of longitudinally spaced shuttle plates mounted on said shuttle shaft, each of said shuttle plates corresponding to and being located in one of said longitudinally spaced chambers in said housing, said shuttle plates being adapted to seal each of said pressure chambers only at each end of said storke;

(d) one or more ports communicating through said tubular body and into each of said port chambers;

(e) means for supplying pressurized air to said pressure chambers; and

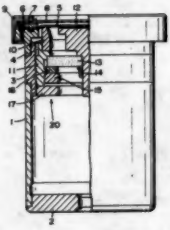
(f) means for moving said shuttle axially through said stroke; whereby pressurized air in each of said pressure chambers exits through said annular passageways into said port chambers and thence through said ports to produce a seismic pulse in said liquid when said shuttle is moved through said stroke.

4,648,480

CONDENSER MICROPHONE HAVING RESISTANCE AGAINST HIGH-TEMPERATURE AND RADIOACTIVE RAYS

Kenshu Watanabe; Kiminori Shiba, both of Mito; Mikiya Arai; Masaya Yamaguchi, both of Yokohama; Yasuo Fujiki, Fujisawa, and Ryohei Fujimoto, Kamakura, all of Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Aug. 16, 1985, Ser. No. 766,433
Claims priority, application Japan, Sep. 10, 1984, 59-188032
Int. Cl.[4] H04R *7/00*
U.S. Cl. 181—158 **6 Claims**



1. A condenser microphone having resistance against high temperature and radioactive rays, comprising:

a. first cylindrical body having a bottom end member at its one end,

b. second cylindrical body threadedly engaged at its one end to an other end of said first cylindrical body,

c. ring means threadedly engaged with an other end of said second cylindrical body,

d. a vibration membrane fixed at its circumferential end to said ring means,

e. microphone structural body threadedly engaged with an inner surface of said second cylindrical body,

wherein said microphone structural body comprises:

tension means for imparting a tension to said vibration membrane,

a backplate having an upper surface spaced from said vibration membrane,

a glass insulator between said tension means and said backplate to thereby form a unitary structure of said microphone structural body, and

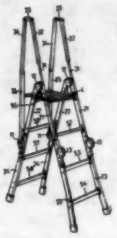
wherein said tension means and said backplate are made of a metal having a small coefficient of linear expansion relative to said ring means.

4,648,481

MULTIPURPOSE ALUMINUM FOLDING LADDER EQUIPPED WITH A DETACHABLE STAND-ON BOARD AND SUPPORTING HANDRAILS

Dickey Lee, Taipei, Taiwan, assignor to Alpha Metal Corp., Taipei, Taiwan

Filed Apr. 21, 1986, Ser. No. 858,523
Int. Cl.[4] E06C *5/44, 1/38, 5/36;* A63B *21/06*
U.S. Cl. 182—28 **6 Claims**



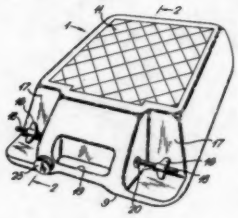
1. A multi-purpose aluminum folding ladder detachably equipped with supporting handrails as well as a stand-on board, comprising 3 paired fixing knuckles, 4 paired ladder upright bar members and a plurality of rungs, and each said supporting handrail consisting of 4 hollow bar members and 1 grip bar wherein one of said pivotably-connected bar members is removably bolted to one of said fixing knuckles with the other bar members extendably received in each other consecutively, and between the two parallel bottommost bar members of said supporting handrails disposed a transverse rung on which said stand-on board can partially be supported, on the bottom of said stand-on board disposed a number of U-shaped hook elements which are employed to engage said stand-on board with said rungs of the ladder so to firmly fixed said stand-on board thereon, and said board being readily foldable and attached to the bottom of said ladder with the top side of said folded board lower than the bottommost rung so not to hinder normal operation of said ladder.

4,648,482

LADDER ANCHOR

Michael J. Kitson, 6, Waters Green Court, Brockenhurst, Hants., SO4 7SQ, United Kingdom

Filed Oct. 28, 1985, Ser. No. 791,834
Int. Cl.[4] E06C *7/42*
U.S. Cl. 182—108 **10 Claims**



1. A ladder anchor comprising a hollow member having:

a wedge shaped front portion which is generally triangular in cross section and has a bottom and a sloping front face;

a rear portion which is generally rectangular in cross section and has a bottom and a top;

a closable orifice for filling the member with ballast or discharging ballast therefrom; and

at least one recess in the sloping front face of the front portion for receiving the longitudinal struts of a ladder; the bottom of the front portion and the bottom of the rear portion being coextensive and providing a ground engaging surface, and the top of the rear portion providing a foot receiving surface.

4,648,483

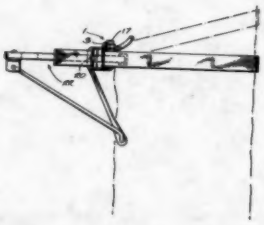
CAM LOCK

Helmut K. Skyba, Rte. 2, Box 330, Wild Rose, Wis. 54984

Filed Nov. 1, 1985, Ser. No. 794,002

Int. Cl.[4] A01M *31/02*; A45F *3/26*

U.S. Cl. 182—187 **13 Claims**



1. A cam lock mechanism for a flexible strap or rope or the like comprising a cam wheel having a curved periphery, an aperture eccentrically located with respect to the curved periphery, a bracket including two upstanding legs spaced a distance greater than the thickness of the cam wheel and rope diameter to provide a rope release channel between the cam wheel and one of said legs, and a pin extending through the leg apertures and the aperture in the cam wheel and including a coil spring with the coil spring coil located within said cam wheel aperture, one end of said coil spring being connected to said cam wheel, the other end hooked in an aperture in a leg and including means for positively locating the spring on said pin.

4,648,484

SUPPORT ASSEMBLY

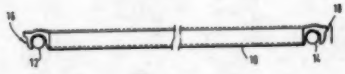
Dennis W. Lovering, Wolverhampton, England, assignor to GKN Kwikform Limited, London, England

Filed Jun. 12, 1986, Ser. No. 873,542

Claims priority, application United Kingdom, Jun. 19, 1985, 8515557

Int. Cl.[4] E04G *5/08*, *1/15*

U.S. Cl. 182—222 **5 Claims**



1. A support assembly comprising at least one elongate element and two horizontally spaced supports of circular exterior cross-sectional form, each end of said elongate element being provided with a connector for engagement with a respective said support for mounting the elongate element on said supports to extend therebetween substantially perpendicular thereto, each said connector having a mouth opening downwardly over a respective support and a generally arcuate re-entrant internal surface extending between the extremities of the mouth, the circumferential length of said arcuate surface being greater than half the circumference of the support and being so dimensioned and arranged with respect to the support that, when the elongate element is supported between the supports without loading applied thereto, a clearance is provided between both sides of each support and said arcuate surface of a respective connector in a plane extending through a diameter of a support parallel to the longitudinal axis of the elongate element and whereby, in such position, the connectors are prevented from upwardly directed disconnection from their respective supports due to the re-entrant curvature of the arcuate surfaces of the connectors, but whereby upwardly directed disconnection of one connector from its respective support is permitted upon displacement of the elongate element in a direction parallel to its longitudinal axis to take up a said clearance between the other connector and its respective support on that side thereof remote from the other support.

4,648,485

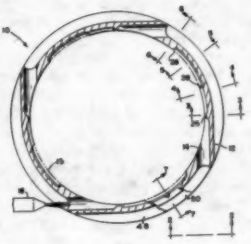
RADIAL SCOOP CONSTRUCTION

Stanley K. Kovaleski, South Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 4, 1985, Ser. No. 784,088

Int. Cl.[4] F16N *7/26*, *7/36*, *25/04*; F16C *3/14*

U.S. Cl. 184—13.1 **5 Claims**



1. A scoop device for metering the flow of oil in opposite directions along a turbine shaft for lubricating devices at opposite sides of the device, said device being a ring adapted to be positioned around and in contact with the surface of the shaft, said scoop device having:

several tangentially arranged inlet passages for the admission of oil to the device,

said device having inwardly extending spaced circumferentially extending ribs to define a channel, the outer wall being defined by the inner surface of the device located between said circumferentially extending ribs.

an axial rib on the inner surface of the device at a point circumferentially spaced from one oil inlet passage and adjacent to the next oil passage to form one end of the channel,

said spaced circumferentially extending ribs terminating at a point spaced from said axial rib to allow oil in the channel to flow laterally from said channel,

said device having spaced grooves therein adjacent said circumferentially spaced ribs and in the sides of said circumferentially extending ribs opposite to the channel to receive oil from the channel,

said grooves having outer sidewalls formed by other inwardly extending circumferential end ribs on said device, and

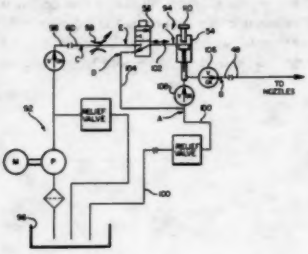
each of said other end ribs having a notch in its inner edge for metering the flow of oil from the spaced grooves axially in both directions from the device.

4,648,486

APPARATUS FOR LUBRICATING A MOVING CHAIN

John P. Kayser, and Philip J. Kast, both of Madison, Wis., assignors to Madison-Kipp Corporation, Madison, Wis.

Filed Oct. 10, 1984, Ser. No. 659,365
Int. Cl.[4] F16N *7/24, 13/22, 11/10*
U.S. Cl. 184—15.1 **2 Claims**



1. In metering pump apparatus for delivering a metered amount of lubricating fluid from a pressurized fluid reservoir to a lubricating fluid delivery line for lubricating a chain conveyor during a lubrication cycle, the improvement comprising:

a metering pump with a pump body having an elongated chamber and piston means in said chamber including a movable piston, said piston means sealingly dividing the chamber into a pumping chamber at one end and a priming chamber at the other end;

spring bias means urging said movable piston away from said pumping chamber and towards said priming chamber;

first check valve means interconnecting the metering pump pumping chamber to the lubricating fluid delivery line for enabling the flow of lubricating fluid in only one direction outwardly from the pumping chamber;

a three-way actuable fluid valve including an inlet, an outlet, and an intermediate port, with the fluid valve inlet connected to said pressurized fluid reservoir for receiving the lubricating fluid under pressure, and the fluid valve outlet connected to the metering pump priming chamber;

second check valve means connected to the metering pump pumping chamber for enabling the flow of lubricating fluid in only one direction inwardly into the pumping chamber; and

a conduit interconnecting the second check valve means to the actuable fluid valve intermediate port;

said actuable fluid valve upon actuation delivering the pressurized lubricating fluid to said priming chamber to force said piston towards said pumping chamber and thereby deliver a shot of lubricating fluid from said fluid delivery line during a lubrication cycle, and

said spring bias means upon deactuation of said actuable fluid valve at the end of the lubricating cycle, urging said piston away from said pumping chamber and towards said priming chamber to deliver lubrication fluid in said priming chamber through said intermediate port, conduit and second check valve into said pumping chamber to prime the metering pump pumping chamber for the next lubrication cycle.

4,648,487

DRIVE WHEEL EQUIPPED WITH POWER SPRING

Shigeo Kimura, Omochano, Japan, assignor to Kabushiki Kaisha Bandai, Japan

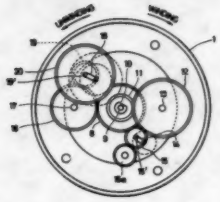
Filed Jun. 14, 1985, Ser. No. 745,295
Claims priority, application Japan, Mar. 14, 1985, 60-51414
Int. Cl.[4] F03G *1/08;* A63H *29/04*
U.S. Cl. 185—39 **2 Claims**

1. A drive wheel provided with a power spring for a vehicle comprising:

a casing of a cylindrical hollow shape serving as a wheel frame, said casing being formed on one side with a drum housing for accommodating said power spring;

a sun gear rotatably mounted centrally of said casing, said sun gear being formed with a first engaging section to which one end of said power spring is fixed while the other end of said power spring is fixed at the inner periphery of said drum housing;

a fixed pinion in which a shaft of said sun gear is rotatably inserted, said fixed pinion being formed with a second engaging section to which said vehicle is fixedly connected;



a spring winding gear train in cooperative association with said sun gear and fixed pinion, said spring winding gear train being provided with a first shift gear movable generally in the radial direction or perpendicular direction to the rotation of said shaft; and

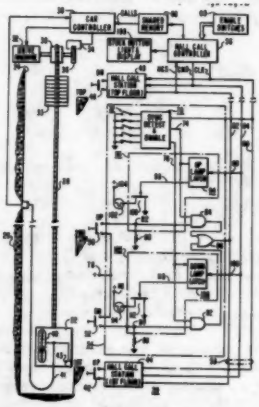
a spring release gear train in cooperative association with said sun gear and fixed pinion, said spring release gear train being provided with a second shift gear movable generally in the radial direction or perpendicular direction to the rotation of said shaft.

4,648,488

ELEVATOR SYSTEM

Matthew Martin, Randolph, and Richard H. Ludwig, West Caldwell, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 5, 1985, Ser. No. 741,401
Int. Cl.[4] B66B *1/46*
U.S. Cl. 187—126 **12 Claims**



1. An elevator system including at least one elevator car mounted in a building to serve the floors therein, pushbuttons for registering calls for elevator service, and control means for

operating the elevator car to serve and reset said calls, the improvement comprising:

means for identifying a stuck pushbutton,

means for masking a call initiated by a stuck pushbutton,

and means for periodically providing elevator service to the floor associated with the stuck pushbutton.

4,648,489

BRAKING PRESSURE CONTROL UNIT

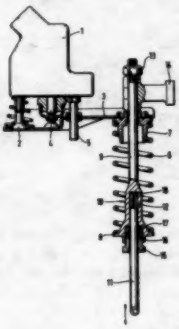
Ernst Schmoelzer, Frankfurt am Main, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 19, 1985, Ser. No. 747,004

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1984, 3422621

Int. Cl.[4] B60T *8/18, 8/26*

U.S. Cl. 188—195 **2 Claims**



1. A braking pressure control unit for a brake system for a vehicle comprising, in combination:

a housing having at least one control piston valve mounted therein;

a transmission lever mounted in and extending away from said housing, one end of said transmission lever engaging said piston valve;

a spring hinge element connected to the other end of said transmission lever;

first and second actuating rods, said second actuating rod having a first end extending through said spring hinge element and having a second end provided with a bore for receiving a first end of said first actuating rod;

means for connecting the second end of said first actuating rod to a part of the vehicle which is movable relative to said housing in response to vehicle loading;

a first spring coaxially surrounding said first and second actuating rods and mounted between said spring hinge and radial projection of said second actuating rod; and,

a second spring in said bore for resiliently urging said first and second actuating rods away from one another.

4,648,490

SHOCK ABSORBER

Raymond A. Bergloff, Woodland Hills, Calif., assignor to HR Textron Inc., Valencia, Calif.

Continuation-in-part of Ser. No. 505,526, Jun. 17, 1983, Pat. No. 4,597,548. This application Jun. 27, 1985, Ser. No. 749,257

The portion of the term of this patent subsequent to Jul. 1, 2003, has been disclaimed.

Int. Cl.[4] F16F *9/19*

U.S. Cl. 188—297 **4 Claims**

1. A shock absorber for connection between an impact generating device and a relatively stable member comprising:

a first fluid containing chamber;

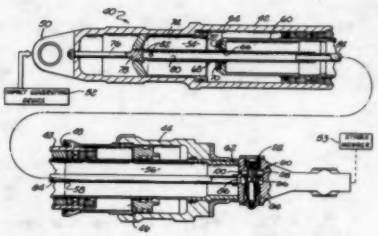
a second fluid containing chamber;

means for connecting said first and second chambers between the stable member and the impact generating device;

means for varying the volume of at least one of said chambers responsive to loads applied by said impact generating device;

first fluid flow path means connected between said chambers including a first orifice therein;

second fluid flow path means connected between said chambers in parallel with said first path and including a second orifice therein;



means for varying the area of at least one of said orifices including a spool valve normally blocking said at least one orifice, responsive to the magnitude of said load exceeding a predetermined threshold;

means for sensing the pressure in one of said chambers; and

means connected to said pressure sensing means for producing a signal responsive to said load exceeding said threshold for moving said spool valve to open said orifice, the area of the other of said orifices being independently varied responsive to loads applied to said shock absorber.

4,648,491

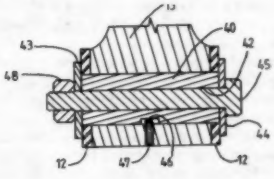
BRAKE SHOE RETAINER MOUNTING ASSEMBLY

Gordon J. Taylor, Tayco Pty. Ltd. P.O. Box 108, Corinda, QLD., Australia (4075)

Filed Feb. 22, 1985, Ser. No. 704,620

Int. Cl.[4] F16D *51/00*

U.S. Cl. 188—341 **5 Claims**



1. A brake shoe retainer mounting assembly for pivotally mounting two brake shoes to a spider, the shoes having two spaced flanges having outer faces between which the spider is positioned, the assembly including:

a cylindrical anchor pin having a longitudinal through bore, the pin having a length greater than the distance between the outer faces of the shoe flanges;

a retainer washer located at each end of the anchor pin, each said washer having a diameter substantially larger than the diameter of the pin; and

a fastener extending through the bore for clamping the washers against the ends of the pin, a respective said pin passes through aligned apertures in each said shoe and an aperture in the spider and when the fasteners are tightened

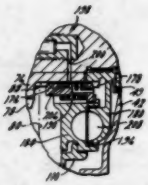
the shoes are free to pivotally move relative to the respective said pin and the washers maintain the shoes in proper alignment relative to the spider.

4,648,492

MECHANISM TO ENGAGE PART TIME DRIVE SYSTEM IN A MOVING VEHICLE

Thomas S. Moore, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 5, 1983, Ser. No. 539,203
Int. Cl.[4] F16D *11/10, 23/02*
U.S. Cl. 192—3.21 **10 Claims**



1. A device for driveably connecting rotating members comprising:

a rotatably mounted driven member having a first clutch surface;

a rotatably mounted driven member having a second clutch surface;

lockup means movable to an engagement position where the driving member and driven member are driveably connectable and movable to a disengagement position where said connection is prevented, said connection being made when the speeds of the driving member and driven member so permit;

actuating means for moving the lockup means to the engagement position and to the disengagement position;

means for accelerating the driven member toward the speed of the driving member and within a range of speed that permits the lockup means to connect the driving member and the driven member when the lockup means is moved to the engagement position and for producing no such acceleration when the lockup means is moved to the disengagement position;

and wherein the lockup means further includes:

a hub, having a third clutch surface continuously engaged with either the first clutch surface or the second clutch surface, adapted to engage selectively either the second clutch surface of the first clutch surface with which the hub is not continuously engaged;

a collar adapted to move in accordance with movement of the actuating means;

retention means for preventing movement of the collar relative to the hub in a first direction and for permitting movement of the collar relative to the hub in a second direction; and

spring means for resiliently biasing the hub toward the retention means and for resiliently biasing the third clutch surface into engagement with either the second clutch surface or the first clutch surface with which the hub is not continuously engaged.

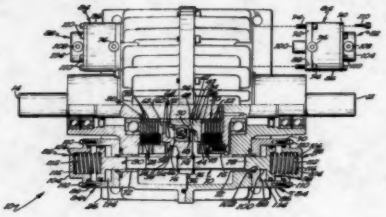
4,648,493

ROTATIONAL CONTROL APPARATUS

Hugh K. Schilling, St. Paul; Leonid Dayen, Plymouth, and Charles D. Raines, Blaine, all of Minn., assignors to Horton Manufacturing Co., Inc., Minneapolis, Minn.

Filed Dec. 9, 1985, Ser. No. 806,662
Int. Cl.[4] F16D *67/04, 25/08, 25/10*
U.S. Cl. 192—18 A **20 Claims**

1. In an apparatus for providing rotational control between a first member, a second member, and a third member, with the apparatus including: means for rotatably mounting the first member, the second member, and the third member with respect to each other; a first rotational interfacing element secured to the second member; a second rotational interfacing element secured to the third member; a rotational interfacing member intermediate the first and second rotational interfacing elements; and means secured to the second member for reciprocating the rotational interfacing member for interfacing with the first and the second rotational interface elements, with the improvement comprising an improved rotational interfacing member comprising, in combination: a first pressure plate, with the first pressure plate being slideably mounted and rotatably related to the first member, with the first pressure plate having means for interfaceing with one of the first and the second rotational interfacing elements; a second pressure plate, with the second pressure plate having means for interfacing with the



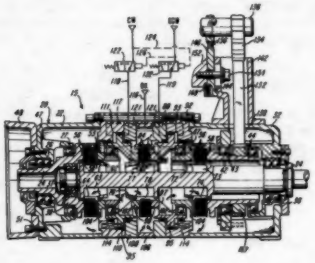
other of the first and the second rotational interfacing elements; means for interconnecting the first and second pressure plates for axial movement together and for allowing relative rotation with respect to each other, with the reciprocating means comprising an actuating rod reciprocally mounted in the second member, a radially extending ear formed on the second pressure plate of the rotational interfacing member, with the actuating rod extending axially through an aperture formed in the ear, means for preventing slideable movement of the ear with respect to the actuating rod for interconnecting the rotational interfacing member to the actuating rod for axial movement therewith, and means for reciprocating the actuating rod in the second member, with the axial movement of the sdcond pressure plate axially moving the first pressure plate in unison due to the interconnecting and rotation allowing means.

4,648,494

CLUTCH-BRAKE UNIT WITH IMPROVED OIL PUMP IMPELLERS

Jerry L. Yater, Hamilton, Ohio, assignor to Force Control Industries, Inc., Fairfield, Ohio

Division of Ser. No. 628,405, Jul. 6, 1984, Pat. No. 4,577,738.
This application Feb. 10, 1986, Ser. No. 827,902
Int. Cl.[4] F16D *11/06*
U.S. Cl. 192—18 A **4 Claims**



1. In a clutch-brake unit including a housing, supply of oil

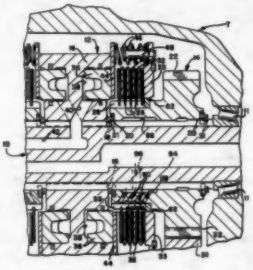
within said housing, an input shaft and an output shaft rotatably supported within said housing on a common axis of rotation, a series of interfitting clutch plates and clutch discs within said housing, said clutch plates mounted on said input shaft for rotation therewith and the interfitting said clutch discs mounted on said output shaft for rotation therewith, a series of interfitting brake plates and brake discs positioned in axially spaced relation to said series of clutch plates and discs, said brake discs mounted on said output shaft for rotation therewith and the interfitting said brake plates being supported for non-rotation by said housing, an annular actuating piston supported within said housing coaxial with said output shaft and for non-rotating axial movement, means connected to said piston for applying an axially compressive force to said series of clutch plates and discs in response to movement of said piston in one axial direction to couple said input shaft with said output shaft, means for applying an axially compressive force to said series of brake plates and discs in response to movement of said piston in the opposite axial direction for braking said output shaft to said housing, a first oil pump impeller on said output shaft within said series of clutch plates and discs, a second oil pump impeller on said output shaft within said series of brake plates and discs, and said impellers being effective to supply oil under pressure to said plates and discs upon rotation of said output shaft and to circulate oil within said housing, the improvement wherein said first and second axially spaced oil pump impellers have corresponding inlets facing in the same axial direction, wall means on said output shaft and forming a barrier separating said inlets, and means within said housing defining separate passages for directing oil within said housing on opposite sides of said wall means and independently to each of said inlets of said impellers.

4,648,495

CLUTCH ASSEMBLY AND LUBRICATION ARRANGEMENT

George R. Vater, Clarendon Hills, and Joachim Horsch, Lombard, both of Ill., assignors to J. I. Case Company, Racine, Wis.

Filed Aug. 28, 1985, Ser. No. 770,315
Int. Cl.[4] F16D *25/064, 13/74*
U.S. Cl. 192—70.12 **2 Claims**



1. A power-transmitting clutch assembly and improved arrangement for effecting lubrication thereof, comprising:

a shaft;

a drum-like clutch carrier mounted on said shaft for rotation therewith;

gear means rotatably mounted on said shaft in generally adjacent axial relation to said clutch carrier;

a plurality of generally annular, first clutch friction plates mounted on said gear means, including spline means for coupling said friction plates and said gear means for rotation together, said friction plates being positioned generally within said clutch carrier;

a plurality of generally annular, second clutch separator plates respectively disposed between adjacent ones of said friction plates such that said friction plates and said separator plates are arranged in an alternating array, said separator plates being disposed within said clutch carrier and including means for coupling said separator plates to said clutch carrier for rotation therewith;

means for urging said friction plates and said separator plates axially into frictional engagement with each other so that said gear means is coupled in power-transmitting relation with said clutch carrier and is rotatable therewith, said means for urging comprising an annular clutch piston mounted in said clutch carrier for movement responsively to fluid pressurization of said piston, said arrangement including clutch return spring means arranged in opposition to said clutch piston;

means for supplying lubricant into said clutch carrier generally at said spline means coupling said friction plates and said gear means, said lubricant supplying means comprising a pressurized lubricant supply conduit defined by said shaft, and at least one lubricant passage defined by said gear means and in fluid communication with said supply conduit for supplying lubricant into said clutch carrier at said spline means; and

means for inhibiting flow of lubricant out of said clutch carrier to enhance the service life of said spline means,

said means for inhibiting lubricant flow comprising annular seal means arranged concentrically about said shaft and extending between and being in sealing engagement with said gear means and said clutch carrier so that flow of lubricant axially out of said clutch carrier between said gear means and said clutch carrier is substantially prevented,

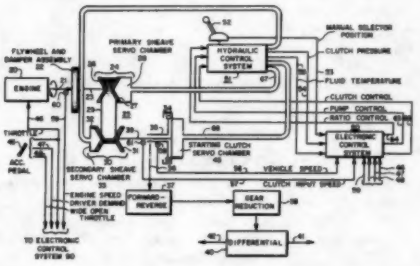
said means for inhibiting lubricant flow further comprising means for restricting lubricant flow radially of said clutch carrier including friction surface means of said friction plates, wherein said friction surface means defines a plurality of grooves arranged to inhibit and substantially prevent flow of lubricant radially of said clutch carrier through said grooves.

4,648,496

CLUTCH CONTROL SYSTEM FOR A CONTINUOUSLY VARIABLE TRANSMISSION

Werner P. Petzold, Harwood Heights, and Alan L. Miller, Chicago, both of Ill., assignors to Borg-Warner Automotive, Inc., Troy, Mich.

Filed Apr. 12, 1985, Ser. No. 722,578
Int. Cl.[4] B60K *41/02*
U.S. Cl. 192—0.076 **17 Claims**



1. A clutch control system for regulating torque transfer from an engine through a continuously variable transmission to an associated driveline mounted in a vehicle, a fluid-actuated clutch operable to transfer drive torque to the associated driveline, a clutch supply line connected to supply fluid to apply the clutch and to discharge fluid to release the clutch, and a clutch

control valve assembly coupled to said clutch supply line, which clutch control system comprises:

a mode determination circuit connected to supply mode output signals to place the clutch control system in one of a plurality of operating modes, including start mode and drive mode;

means for supplying a plurality of information input signals, including a vehicle speed signal and a clutch input speed signal, to the mode determination circuit; and

means, in the clutch control system, for providing a regulating signal for the clutch control valve assembly which varies in accordance with the operating mode selected by the mode determination circuit.

4,648,497

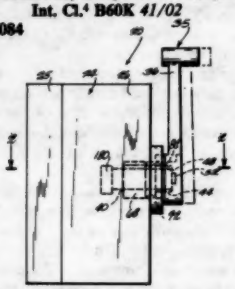
SINGLE LEVER CONTROL

Anthony F. Prince, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Mar. 22, 1985, Ser. No. 715,202

Int. Cl.[4] B60K *41/02*

U.S. Cl. 192—0.084 **21 Claims**



1. A single lever control for use with an engine including a clutch and a throttle, said control comprising a housing, a control member rotatably mounted on said housing for movement between a neutral position and a full throttle position through a clutch engaging interval and then a clutch engaged throttle advancing interval, clutch drive means adapted to be connected to the engine clutch and selectively operably connected to said control member for providing engagement of the engine clutch in response to rotation of said control member through said clutch engaging interval, and throttle drive means adapted to be connected to the engine throttle and selectively operably connected to said control member for providing substantial advancement of the engine throttle in response to rotation of said control member through the clutch engaging interval.

4,648,498

MOTOR-OPERATED CLUTCH

Jean Herbulot, Franconville, and Gérard Escaillas, Paris, both of France, assignors to Valeo, Paris, France

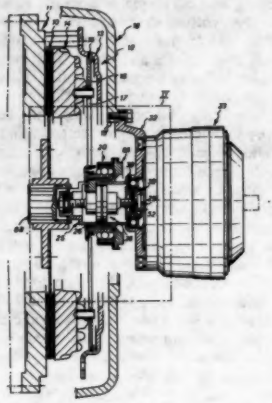
Filed Apr. 8, 1986, Ser. No. 849,397

Claims priority, application France, Apr. 17, 1985, 85 05779

Int. Cl.[4] F16D *19/00*

U.S. Cl. 192—94 **16 Claims**

1. Clutch comprising a casing, an intermediate member attached to said casing, a rotary drive member mounted on said intermediate member, an axial cartridge on said intermeidate member, a support and guide member formed by an outside surface of said cartridge adapted to have an axially mobile actuator member disposed on it, a housing within said cartridge, and a screw-and-nut type transmission in said housing comprising a scew element and a nut element of which one is



constrained to rotate with said drive member and the other is adapted to be coupled axially to said actuator member.

4,648,499

RELEASE BEARING MOUNTING

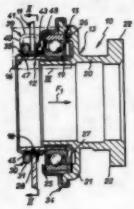
Dominique Despres, Clichy, and Philippe Lassiaz, Boulogne, both of France, assignors to Valeo, Paris, France

Filed Dec. 19, 1984, Ser. No. 683,390

Claims priority, application France, Dec. 27, 1983, 83 20829

Int. Cl.[4] F16D *23/14*

U.S. Cl. 192—98 **17 Claims**



1. A pull-type clutch release bearing assembly having an axis and comprising a clutch release bearing coupled to a clutch release device of a clutch in at least one axial direction for operating the clutch release device, said clutch release bearing comprising a bearing member and an axial bush extending axially away from said bearing member through the clutch release device, a coupling member having a radial bearing flange engageable with a side of the clutch release device axially remote from said bearing member for actuating the clutch release device in the one axial direction, a radially deformable coupling ring disposed around the axis of the assembly for releasably connecting said coupling member and said axial bush, retaining means axially connecting said coupling member to the clutch release device, said coupling ring normally engaged between a bearing surface on said coupling member facing axially in the direction away from said bearing member and an opposite bearing surface on said axial bush facing axially in the direction toward said bearing member, said opposite bearing surface defining one flank of an annular groove, a decoupling member defining the other flank of said annular groove and mounted for axial sliding movement on

said axial bush between a normal position relatively axially adjacent said bearing member and a decoupling position relatively axially remote from said bearing member in which said decoupling member is adapted to drive said coupling ring out from between said bearing surface and said opposite bearing surface so that the coupling ring is maintained in engagement with said coupling member.

4,648,500

CLUTCH RELEASE MEANS

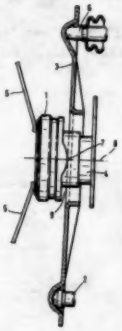
Walter Parzefall, Bubenreuth, Fed. Rep. of Germany, assignor to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Mar. 8, 1985, Ser. No. 709,515

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1984, 3411641

Int. Cl.⁴ F16D *13/70*

U.S. Cl. 192—99 S **2 Claims**



1. A clutch release means for motor vehicles consisting of a housing holding a rolling bearing, said housing being axially moveable on guiding means concentric with the clutch axis under the action of a pivoted clutch fork characterized in that the housing (1) has curvatures (7) at the contact points with clutch fork (3) which are turned toward the latter and whose vertices lie in a plane passing through clutch axis (8) and the contact surfaces (9) of clutch fork (3) have a flat form.

4,648,501

APPARATUS FOR SORTING AND ALIGNING HANDLES FOR CARDBOARD BOXES OR THE LIKE AND FOR SUPPLYING SUCH TO AN INSERTION APPARATUS

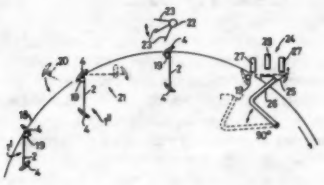
Willson B. D. Grant, Qu'Appelle; Little Ffieth, Henley-on-Thames, Great Britain (RG9 6NV), assignor to Barbara Ann Grant and Willson Barratt David Grant, both of Henley-on-Thames, Great Britain

Filed May 24, 1985, Ser. No. 737,411

Claims priority, application United Kingdom, May 24, 1984, 8413373

Int. Cl.⁴ B65G *47/24*

U.S. Cl. 198—397 **8 Claims**



1. An apparatus for sorting platic material handles for cardboard boxes or the like containers, with said handles comprising a main, elongate portion with a lug at each end extending on either side of the plane of said elongate portion and subtending an acute angle at one side of the handle, comprises a housing defining a reservoir portion for receiving a supply of randomly disposed handles; rotary support means and drive means therefor, supporting at least one carrier rod displaceable through said reservoir portion and which carrier rod and each of them is of a diameter such as to be able to engage between the main elongate portion of the handle and the portion of the lug subtending an acute angle therewith; means for ensuring handles picked up by each said carrier rod are transported by each said carrier rod only on one selected side thereof for further processing; and means for removing the thus sorted handles in alignment and supplying such for subsequent handling and processing; wherein said means for sorting the handles carried by each of the carrier rods ensure the handles are supported on one selected side of each of the carrier rods comprises a selective, handle-disloding means displaceable beneath each carrier rod when it is in an upper region of its movement path and engageable with one or more handles which may be suspended therefrom to displace the main bodies of the handles upwardly and to one side of each of said carrier rods and cause any handle disposed on one "incorrect" side of each said carrier rod to be disengaged from said carrier rod while permitting any handle disposed on the opposite, "correct" side of said carrier rod to remain suspended therefrom.

4,648,502

TRANSPORT CONVEYOR FOR CONICAL OBJECT

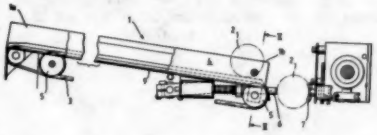
Alan Smith, Accrington, and Bhupendra Patel, Brierfield, both of England, assignors to 501 Hollingsworth (U.K.) Ltd., Lancashire, England

Filed Jun. 11, 1985, Ser. No. 743,538

Claims priority, application United Kingdom, Jun. 13, 1984, 8415002

Int. Cl.⁴ B65G *47/24*

U.S. Cl. 198—399 **12 Claims**



1. In textile appartus including a conveyor for transporting a plurality of conical winding tubes to a point of use, the improvement wherein said conveyor comprises: (a) an inclined chute having a stationary floor extending between a receiving end and a delivery end and arranged for supporting and guiding a succession of the conical tubes between said receiving and delivery ends of the chute with alternating orientation of successive tubes along the chute; (b) first and second friction means above the floor and laterally spaced with respect to the chute center line on respective opposite sides thereof; and (c) means driving said first and second friction means to move along the chute in a direction from the delivery end to the receiving end thereof, each of said first and second friction means having a friction surface to engage and to swivel the conical tubes on the chute for rotating such tubes to cause them to remain mutally parallel as they roll along the chute towards the delivery end.

4,648,503

ARTICLE TURNING DEVICE

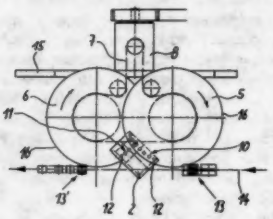
Kurt Stemmler, Neuwied, and Martin Blumle, Horhausen, both of Fed. Rep. of Germany, assignors to Winkler+Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. KG, Neuwied, Fed. Rep. of Germany

Filed Jan. 14, 1985, Ser. No. 691,279

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1984, 3401511

Int. Cl.[4] B05G *47/24*

U.S. Cl. 198—410 10 Claims



1. A device for turning flat articles being conveyed along a conveying path, more particularly letter envelopes, flat bags or the like, said articles being turned in the flat condition about a vertical axis by 90°, said device comprising a first entraining member rotatable about a vertical axis, a second entraining member rotatable about a vertical axis offset from the axis of said first entraining member in the direction of article conveyance and overlapping said first entraining member to some extent, said first and second entraining members together turning the article being turned by 90°, and each entraining member having means for taking up and delivering the article being turned whereby one entraining member supports the article from above and the other entraining member supports the article from below.

4,648,504

CONVEYOR DEVICE WITH TWO BELTS FOR SWEET PRODUCTS

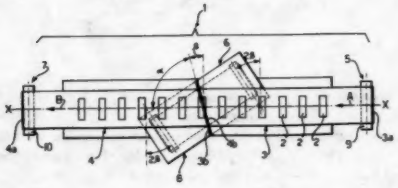
Renzo Francioni, Grignasco, Italy, assignor to Cavanna S.p.A., Prato Sesia, Italy

Filed Jul. 9, 1984, Ser. No. 628,990

Claims priority, application Italy, Jul. 26, 1983, 22496/83[U]

Int. Cl.[4] B65G *37/00*

U.S. Cl. 198—606 4 Claims



1. A conveyor device including at least two longitudinally aligned endless conveyor belts having the same direction of advance, for conveying along said belts from one to the other in the direction of advance relatively long, narrow articles transversely disposed on said belts, said belts being endwise aligned and adjacent each other, and respective drive and return means between which each of said belts are tensioned, opposed ends of said belts being adjacent each other and supported by said return means, adjacent ends of said belts being oriented at an angle relative to the direction of advance, each of said return means being formed of a pair of spaced upper and lower plate means and an integral connecting wall means, each of said spaced plate means including a feather oriented diagonally with respect to the direction of advance, and at least one roller means interposed between said feathers, the roller means being oriented at twice said angle, one of said feathers smoothing transition of an article from one belt to the other, and the roller means and the other of said feathers realigning the belt.

4,648,505

HOLDER FOR A NUMBER OF WRITING IMPLEMENTS

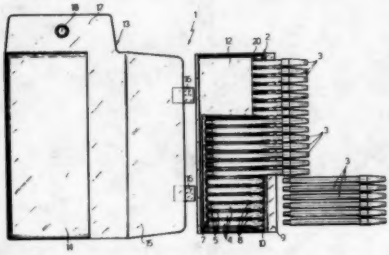
Domenico Belmondo, Mappano, Italy, assignor to Dobell S.r.s. di Domenico Belmondo & C., Mappano-Borgaro Torinese, Italy

Filed Dec. 19, 1985, Ser. No. 810,757

Claims priority, application Italy, Dec. 21, 1984, 54213/84[U]

Int. Cl.[4] B65D *85/28*

U.S. Cl. 206—214 7 Claims



1. A holder for a plurality of writing implements comprising:

(a) a shaped body member having a plurality of longitudinally extending grooves formed therein, said grooves being bordered by longitudinally extending dividing walls,

(b) said grooves together with said dividing walls providing force-fit accomodation for proximal end portions of the writing implements,

(c) said dividing walls having top edges,

(d) a sheet member overlying a substantial portion of said shaped body member and secured to said body member at said top edges of said dividing walls,

(e) said sheet member having a leading edge portion extending transversely across said shaped body member,

(f) said shaped body member and said sheet member forming substantially enclosed compartments in which to house in parallel manner the proximal end portions of the writing implements, the distal end portions of the writing implements extending beyond the confines of said substantially enclosed compartments and being free and unobstructed for the purpose of withdrawal,

(g) said shaped body member including a transversely extending ridge portion for engaging and slightly elevating the distal end portions of the writing implements forcing intermediate portions defined between the proximal and the distal end portions of the writing implements into abutting contact with said leading edge portion of said sheet member, thereby maintaining the proximal end portions of the writing implements securely situated within said grooves regardless of the inclination of said body member, and

(h) a reusable close-up holder for containing said shaped body member.

4,648,506
PACKAGE WITH SPREADER FOR SPREADABLE MATERIAL

Rolf W. J. Campbell, Minneapolis, Minn., assignor to Land O'Lakes, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 773,047, Sep. 6, 1985, abandoned. This application Mar. 24, 1986, Ser. No. 843,262
Int. Cl.[4] B65D *47/10, 85/74*
U.S. Cl. 206—216 19 Claims

1. A package and spreader unit for spreadable material including:

A. a base of sheet material having:

(1) an elongate, relatively stiff, planar blade partially defined by a blade spread side surface and an opposed spaced-apart supply side of the base, said blade having a forward delivery end portion and a rearward handle end portion, and

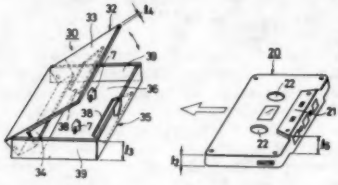
(2) a deformable blister adapted to initially encompass spreadable material, said blister being part of the supply side of the base and being open through said blade and extending outwardly from it on the supply side of the base;

B. a planar membrane initially overlying the opening of the blister through the blade in sealing relation to the spread side surface of the blade around the blister to form a closed receptacle for the spreadable material, a first portion of said membrane adjacent the blade delivery end portion and in underlying relation to a portion of said blister immediately adjacent said blade delivery end portion being manually peelable from sealing relation with respect to said blade, and being frangible and removable from said blade and separable from a second remaining sealed portion of the membrane to provide an outlet for the spreadable material to the spread side surface of the blade.

4,648,507
MAGNETIC TAPE CASSETTE STORAGE CASE

Choji Komiyama, and Kengo Oishi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 5, 1985, Ser. No. 720,243
Claims priority, application Japan, Apr. 6, 1984, 59-50297[U]
Int. Cl.[4] B65D *85/672*
U.S. Cl. 206—232 1 Claim



1. In a magnetic tape cassette storage case comprising a casing and a cover pivotally coupled to said casing so that said casing can be closed and opened by said cover and a magnetic tape cassette can be inserted in said storage case, said magnetic tape cassette being of a type having a thicker portion in which is formed an opening in a front wall of said magnetic tape cassette, the improvement wherein:

said cover and casing comprising walls constructed to confront front and rear surfaces of said magnetic tape cassette, said walls having recesses for receiving said thicker portion of said magnetic tape cassette in which the thickness of each of said walls is reduced, the

a distance between said walls being only slightly larger than a thickness of portions of said magnetic tape cassette other than said thicker portion,

wherein said storage case further comprises means for reinforcing portions of said cover and casing walls in an area of said recesses, said reinforcing means comprising a plurality of thin plastic resin labels.

4,648,508
FLEXIBLE ENVELOPE FOR ELECTRONIC COMPONENT PACKAGING

Robert A. Neal, East Rd., Wales, Me. 04280, and Robert Ray, Lake Shore Dr., Auburn, Me. 04210, assignors to Robert A. Neal and Robert Ray, both of Greene, Me.

Filed Jun. 19, 1985, Ser. No. 746,308
Int. Cl.[4] B65D *73/02, 85/42*
U.S. Cl. 206—328 12 Claims

1. An anti-static envelope having internal inner and outer layers of flexible plastics, said envelope layers being integrally formed by blow film coextrusion of said plastics while in a liquid state, said inner layer comprising an anti-static plastic with a surface resistivity of less than approximately 10^{12} ohms per square, and said outer layer comprising a conductive carbon-containing plastic having a surface resistivity of less than approximately 10^3 ohms per square.

4,648,509
TAMPER-PROOF PACKAGE AND METHOD

Dario M. Alves, 2441 California St., N.W., Washington, D.C. 20008

Filed Jul. 14, 1986, Ser. No. 885,093
Int. Cl.[4] B65D *73/00*
U.S. Cl. 206—459 6 Claims

1. A tamper-proof package for an article comprising:

a first container into which the article is placed and said first container having a self-contained independent means to indicate tampering with said first container;

a cellophane wrapping entirely enclosing and sealing said first container and said wrapping having a self-contained

independent means to indicate tampering with said wrapping;

a second container entirely enclosing and sealing said cellophane wrapping and the said first container, said second container having self-contained independent means to indicate tampering with said second container, said means to indicate tampering with said second container comprises an overlying band with the tearing apart of said band indicating tampering and a tear strip with the tearing open of said tear strip separating said second container and indicating tampering;

a pouch entirely enclosing and sealing said second container;

and the tearing open of said tear strip of said second container interacting with said overlying band of said second container and with said pouch by tearing apart said overlying band and by tearing open and separating said pouch to indicate tampering with said pouch.

4,648,510

EASILY DISPENSABLE DETERGENCY BOOSTER CLOTHS AND DISPENSER THEREFOR

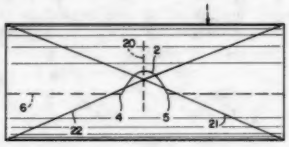
Werner Kuenzel, Langenfeld, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jan. 13, 1986, Ser. No. 818,570

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1985, 3500936

Int. Cl.[4] **B65D** *79/00, 83/08, 85/62;* **C11D** *17/06*

U.S. Cl. 206—494 **10 Claims**



1. A detergency booster cloth dispenser assembly containing an aligned stack of easily removable booster cloths, each said booster cloth comprising a sheet of material which dissolves in water under laundering conditions and which contains releaseable active detergency boosters, each said booster cloth being provided with a curved incision approximately through its center and said dispenser being adapted to maintain each sheet of said stack in an upwardly convex arcuate fashion in said dispenser so as to place said sheets in flexure in the area of said incision.

10. A method for making a detergency booster cloth dispenser containing a stack of easily removable booster cloths, each said booster cloth comprising a sheet of material which dissolves in water under laundering conditions and which contains releaseable active detergency boosters, said method comprising the steps of:

(a) making a curved incision through the same location in each sheet to form a tab area or aperature in said sheet;

(b) disposing a plurality of the incised sheets in a stacked relationship in a container which is adapted to hold each of said sheets in said stack in an upwardly convex arcuate fashion so as to place said sheets in flexure in the area of said incision, the axis of the arcuately flexed sheet (i) being parallel to a line connecting the ends of the tab-forming curved incision or (ii) passing through or close to the aperture-forming curved incision; the tab areas or apertures in the stack being aligned.

4,648,511

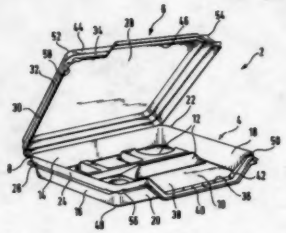
CONTAINER FOR HOLDING FLATWARE AND DINNERWARE FOR SERVING FOOD

Joost R. Ritman, Bloemgracht 15-19, NL-1016 KB Amsterdam, Netherlands

Filed May 16, 1985, Ser. No. 734,849

Int. Cl.[4] **A47G** *23/06;* **B65D** *21/02, 43/16;* **A45C** *11/20*

U.S. Cl. 206—541 **1 Claim**



1. A container for holding flatware and dinnerware comprising:

a rectangular tray-shaped sectioned bottom hinged to a cover member to form an integral case, said container having front, rear and side walls

an opening in said front wall to permit inserting and removing a meal dish without removing the cover and for storing said dish completely inside said container said opening being formed by a recess in the front wall of the bottom member and an opposed recess in the front wall of said container member,

a horizontally-extending peripheral flange on the outside of said side walls,

a downwardly-extending side wall on said cover member which is stepped twice to form flanged sections one of which rests on the top edge of said container side wall and one of which rests on said peripheral flange when said cover is closed on the container,

a curved locking element formed in said peripheral flange in the area of the corners where said side and front walls meet,

opposed complementary curved locking elements formed in said downwardly-extending side wall on said cover member, and

a stacking edge peripherally extending above the top surface of said cover member to facilitate stacking one closed container on another.

4,648,512

PORTABLE COOLER WITH SIDE RECEPTACLE

Richard A. Tarozzi, Gales Ferry, and Charles Formhals, Ledyard, both of Conn., assignors to King-Seeley Thermos Co., Norwich, Conn.

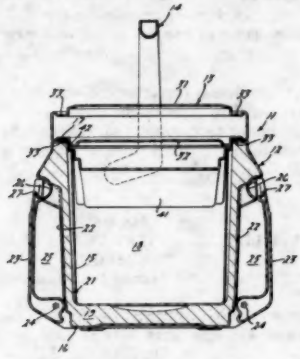
Filed Apr. 15, 1985, Ser. No. 723,444

Int. Cl.[4] **B65D** *81/38*

U.S. Cl. 206—542 **5 Claims**

1. A portable cooler construction having a main body portion having rigid insulating walls formed by a molded inner shell defining a cavity for receiving food products and an opening for affording access to said cavity through an upper surface of said main body portion and a molded outer shell defining an open volume in which said inner shell is nested, and a first closure for selectively opening and closing said opening, the improvement comprising said inner and said outer shells defining an insulating space therebetween and surrounding said cavity, a recess formed in a side wall of said outer shell of said main body portion extending into and surrounded by said insulating space and separated by a portion of said insulating space from said cavity so that said recess and said cavity are each insulated and are insulated from each other, and a second

closure for selectively opening and closing said recess said second closure being formed of a double wall construction with an air gap therebetween, said recess and said closure being configured to form a storage area adapted to receive



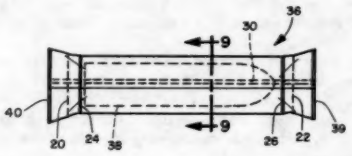
articles when said second closure is in its closed position and to permit insertion and removal thereof when opened, said second closure being substantially coextensive with said recess and said side wall when in its closed position.

4,648,513

PACKAGE AND DISPOSAL CONTAINER INCLUDING PLURAL TEAR PORTIONS

William R. Newman, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sep. 27, 1985, Ser. No. 781,289
Int. Cl.[4] B65D 5/54
U.S. Cl. 206—614 **10 Claims**



1. A package comprising a front sheet and a back sheet, said back sheet and front sheet being joined at side seals inward of the side edges of the sheets, said front sheet and said back sheet joined together to form a bottom that with said side seals forms a container, said back sheet extending above the top of said front sheet forming a flap, said flap being coated with adhesive and providing areas of weakness forming tear lines generally parallel and outboard of said seals wherein said container is rolled around an object to be packaged such that the adhesive bearing flap is fastened to the exterior of said back sheet and the rolled package has the ends sealed outboard of said tear lines.

4,648,514

HANGING HOLDER FOR TAPE CASSETTE

Gerald J. Niles, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 19, 1985, Ser. No. 746,397
Int. Cl.[4] A47G 19/08
U.S. Cl. 211—41 **9 Claims**

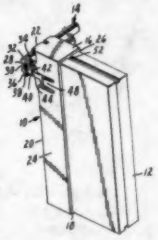
1. A hanging holder adapted to accept a generally rectangular, box-shaped object inserted therein in combination with an elongate channel for supporting said hanging holder, wherein said hanging holder comprises:

a U-shaped frame including a rectangular edge wall and two parallel end walls extending from said edge wall and spaced to accept a said object therebetween; and

at least one hook extending from said edge wall opposite said end walls; wherein said channel comprises:

a back portion having a contact surface; and a hanger portion projecting from said back portion opposite said contact surface and terminating in a lip projecting generally parallel to said contact surface;

said hanger portion and said lip being sized so that, with said



contact surface attached to a vertical surface, said channel horizontal, and said lip projecting upwardly, said at least one hook extending from said hanging holder may be engaged over said lip to hang said holder; and said hanging holder further comprises:

a rib extending from said edge wall in the same direction as said hook to contact said vertical surface when said hook engages said channel lip and cause said holder to hang from said lip at a predetermined angle, said rib being spaced from said hook so as to capture said channel therebetween so that said rib contacts said channel if said holder is moved upwardly and thereby prevents removal of said hook from said lip.

4,648,515

LOOSELEAF BINDER HOLDER

Vernon L. Merritt, 10907 Keese, P.O. Box 34351, Houston, Tex. 77034

Filed Jun. 16, 1983, Ser. No. 504,957
Int. Cl.[4] A47F 7/00
U.S. Cl. 211—43 **12 Claims**

1. A looseleaf binder holder comprising;

a collapsible frame having a flat rectangular rear portion and laterally opposed angular side members which support said frame in a generally vertical position upon a flat horizontal surface, and

a plurality of removable dividers adapted to be slidably received on an upper edge of the rear portion of said frame in adjustable laterally spaced relation for receiving and supporting looseleaf binders in an upright position therebetween.

4,648,516

ADJUSTABLE GUN RACK

Johnny C. Elkins, P.O. Box 2599, San Angelo, Tex. 76902

Filed Jan. 14, 1985, Ser. No. 691,403

Int. Cl.[4] A47F 7/00

U.S. Cl. 211—64 **15 Claims**

1. A gun rack for mounting guns in supported relationship therewithin; said rack includes a main body having a gun receiving cradle means, attachment means formed at each opposed end of said main body by which the rack can be affixed to a support surface;

said main body has a hollow interior at one end thereof, one said attachment means has an extension which is slidably received within the hollow interior of the main body, thereby enabling the spaced opposed attachment means to be moved towards and away from one another, and thereby adjust the distance therebetween;

said extension has one outer wall surface which is provided with teeth, means formed on said cradle means which engages the teeth of the outer wall surface and thereby adjustably secures the extension to the main body;

and means by which said cradle means can by adjustably positioned longitudinally along the main body and said extension.

4,648,517

SHELF SUPPORT STRUCTURE

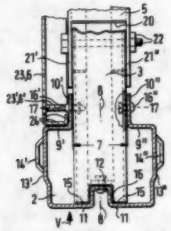
Gerhard Schäfer, Neunkirchen-Salchendorf, Fed. Rep. of Germany, assignor to Fritz Schäfer Gesellschaft mit beschränkter Haftung, Fed. Rep. of Germany

Filed Sep. 24, 1985, Ser. No. 779,669

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1984, 3435246; Dec. 24, 1984, 3447300

Int. Cl.[4] A47F 5/00

U.S. Cl. 211—183 **12 Claims**



1. A shelf support structure comprising upright posts of sheet metal sections and horizontal braces connecting the posts with each other, the horizontal braces formed of sheet metal sections, the posts defining an aperture at a longitudinal side thereof and formed symmetrical in cross-section with respect to a vertical plane extending transversely of the aperture, the aperture bounded on both sides by flanges protruding outwardly at right angles from the walls adjoining the aperture, and a longitudinal ledge protruding inwardly formed in the wall lying opposite the aperture symmetrically to the plane crossing the aperture, wherein the sheet metal sections of the horizontal braces are U-shaped or C-shaped whose longitudinal openings are directed towards the top or the bottom, and wherein the horizontal braces extend with their ends through the apertures of the posts and are connected to the flanges, the improvement which comprises

that the horizontal braces extend with their ends into the sheet metal sections of the posts up to the wall lying opposite the aperture, and that the ends have a recess in which the longitudinal ledge of the post is received in a fork-like manner.

4,648,518

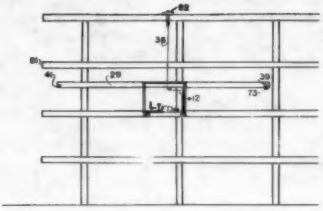
SELF-LIFTING GANTRY CRANE AND BOOM THEREFOR

Logan C. Greeson, 1286 Marine Dr., West Palm Beach, Fla. 33409

Continuation-in-part of Ser. No. 558,456, Dec. 6, 1983, abandoned. This application May 17, 1985, Ser. No. 735,165

Int. Cl.[4] B66C 23/32

U.S. Cl. 212—199 **8 Claims**



1. A rolling gantry crane in combination with lifting boom means therefor for use in a multi-storey building comprising:

(A) a frame,

(B) a horizontal overhead beam centrally fixed to said frame, said beam comprising a cantilevered length thereof extending from an end of said frame,

(C) which means and cable stored thereon mounted on said frame, said winch means being capable of drawing in or paying out said cable,

(D) an overhead support comprising a horizontally swingable boom fixed to said building.

(E) first sheave means mounted on said beam for guiding said cable to a load, second sheave means mounted on said frame in a position to guide said cable upwardly whereby said gantry crane can lift itself from floor to floor up the side of a building, said cable being connected to said overhead support, and means for alternatively guiding said cable to said first sheave means, whereby said winch means can lift a load, said load being connected to said cable.

4,648,519

VENTED CLOSURE

Kenneth R. Kennedy, Newburgh, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

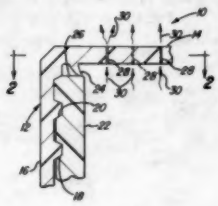
Filed Apr. 28, 1986, Ser. No. 856,195

Int. Cl.[4] B65D 51/16

U.S. Cl. 215—261 **6 Claims**

1. A venting closure for closing a liquid container comprising a cap having a flat top and cylindrical skirt depending therefrom containing means for attachment to a container, said top having at least one cylindrical orifice extending there-

through with a diameter of 0.003 inches or less formed by a laser beam, whereby gas will flow through said orifice when a pressure difference exists between the pressure in said container and atmospheric pressure, but liquid will not pass through said orifice under the action of said pressure difference.

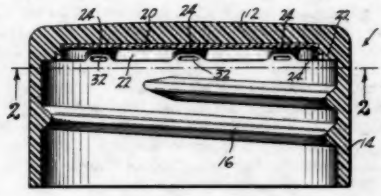


4,648,520

CAP AND MEANS FOR RETAINING CAP LINER

Gene Stull, 5 Oak St., Chester, N.J. 07930

Filed Jun. 11, 1985, Ser. No. 743,489
Int. Cl.[4] B65D *53/04*
U.S. Cl. 215—350 **12 Claims**



1. A plastic closure for use with a container to close the same, comprising in combination:

(a) a cup-shaped molded plastic cap having a top wall and an annular side wall integral with the top wall and provided with means for securing the cap to the dispensing orifice of the container,

(b) a sealing liner disposed in the cap under the top wall thereof,

(c) said cap having an inner ledge ledge structure surrounding the sealing liner and providing a nest therefor,

(d) said inner ledge structure having a plurality of pockets disposed in spaced relation about the sealing liner and opening downwardly with respect to the top wall of the cap,

(e) said inner ledge structure having forcibly inwardly displaced drifted and distorted portions located radially inward of said pockets and overlying peripheral portions of the sealing liner to retain the latter in place against inadvertent dislodgement from the cap, said ledge structure having a pocket behind each displaced portion, said pockets being formed concurrently with the formation of the displaced portions.

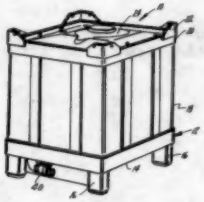
4,648,521

COMPOSITE METAL AND PLASTIC TANK

Larry D. Thomas; David L. Waltke, and Gary Gibson, all of Beatrice, Nebr., assignors to Hoover Group, Inc., Roswell, Ga.

Filed May 27, 1986, Ser. No. 867,120
Int. Cl.[4] B65D *87/00*
U.S. Cl. 220—1.5 **2 Claims**

1. A composite metal and plastic tank comprising a metal frame assembly having a substantially horizontal flat bottom member of rectangular shape, supporting legs for said bottom member depending therefrom, an open framework extending upwardly from said bottom member and terminating in a rectangular top frame member, combination lifting lugs and leg positioners at the corners of said top frame, a hollow plastic container supported on said frame, said container being supported on said bottom member at a position within said framework and being of a size to extend upwardly from said frame bottom member to said top frame member in close proximity to said framework at positions therebetween, said container having a base provided with a discharge opening and a discharge spout extending downwardly from said base in communication with said discharge opening, said frame bottom member having an opening through which said spout extends downwardly, said base having downwardly inclined flow channels formed therein and terminating at said discharge opening to insure complete drainage of said container when desired, a dunnage plate formed of a foam material and supported on said frame bottom member at a position below said container base, said dunnage plate being provided with openings to accommodate the inclined portions of said base to thereby enable said container to be firmly supported on said frame assembly in an upright position with said frame bottom member being substantially horizontal to enable handling of said composite tank with conventional fork lift equipment.

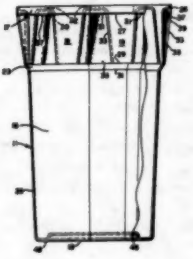


4,648,522

BARREL

Thomas W. Wise, Oreland, Pa., assignor to Plastech International, Inc., Warminster, Pa.

Filed Sep. 9, 1985, Ser. No. 773,463
Int. Cl.[4] B65D *21/02*
U.S. Cl. 220—5 R **10 Claims**



1. A barrel for handling large quantities of bulk material such as meat and other food products, comprising

a molded plastic barrel having a bottom wall and a cylindrical side wall extending upwardly from the bottom wall,

a rim extending circumferentially around the top of the cylindrical side wall,

nesting stop means formed near the top of the side wall and flaring outwardly for facilitating nesting and unnesting of

the barrel in a similar barrel by limiting the distance an upper nesting barrel extends into a lower nesting barrel,

rim support means integrally formed in the top portion of the barrel side wall and extending from the rim of said barrel to the top of the nesting stop means for strengthening and supporting the rim and the barrel,

said rim support means sloping outwardly from the stop means to the rim,

recessed handle means integrally formed between the rim support means for providing handles for an operator handling the barrel,

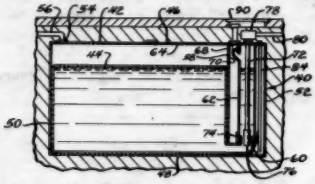
and inward projections of the recessed handle means extending inside the barrel adapted to support the nesting stop means of an upper barrel nested in a lower barrel and providing spaces between said inward projections to allow air to pass between nesting barrels so that a vacuum is not formed between nesting barrels to make pulling them apart difficult.

4,648,523

UNDERGROUND TANK ASSEMBLY WITH INTERNAL BLADDER

Dennis J. Strock, Woodridge, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 20, 1984, Ser. No. 673,420
Int. Cl.[4] B65D *25/00*
U.S. Cl. 220—20.5 **13 Claims**



1. An underground tank assembly for storing motor fuels, such as gasoline or diesel fuel, comprising:

a collapsible primary tank comprising a flexible bladder for containing a motor fuel, said primary tank being moveable from a collapsed generally empty position to an inflated generally full position;

a substantially rigid secondary tank substantially surrounding and enclosing said primary tank for secondary containment of any leakage of motor fuel from said primary tank, said secondary tank having a top, a bottom, and end walls extending between and connecting said top and bottom;

said bladder having a bottom portion positioned adjacent the bottom of said secondary tank; and

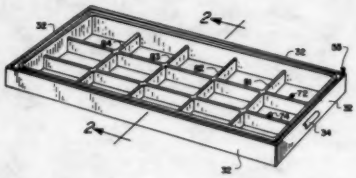
conduit means extending through the top of said rigid secondary tank to a position in proximity to the bottom portion of said flexible bladder, said conduit means including an inlet conduit with an inlet upright portion for filling said flexible bladder with motor fuel and an outlet conduit with an outlet upright portion for withdrawing said motor fuel from said flexible bladder, said outlet upright portion of said outlet conduit being positioned within the interior of and substantially concentrically and coaxially surrounded by said inlet upright portion of said inlet conduit, and said outlet conduit and said inlet conduit both being positioned in proximity to one of said end walls of said rigid secondary tank.

4,648,524

COMPARTMENTED STORAGE CONTAINER

Henry A. Ackermann, Lynnwood, Wash., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 14, 1985, Ser. No. 744,864
Int. Cl.[4] B65D *5/26*
U.S. Cl. 220—22 **2 Claims**



1. A compartmented storage container for use in an automatic parts storage and retrieval system comprising, in part, a plurality of verticaly arranged, horizontally disposed, shelves onto which are adapted to be placed, by horizontal sliding movement, a plurality of trays each of which has a flat rectangular bottom portion, a vertically extending rim portion, and means for facilitating horizontal movement of said trays onto and off of said shelves, said compartmented storage container comprising a free-standing one-piece thin-wall molded plastic body having:

(a) a rectangular shape adapted to fit within the rectangular rim and on top of the bottom portion of one of said trays;

(b) an outside edge portion extending continuously around the entire periphery of said body, said outside edge portion extending from a bottom plane upwardly substantially parallel to the vertical axis a distance substantially equal to the height of the aforesaid rim to an integral and continuous top rounded surface and thence to an inside edge portion integral thereto extending to said bottom plane and substantially parallel to said outside edge portion;

(c) a bottom portion lying adjacent to and parallel to said bottom plane and integrally connected to said inside edge portion; and

(d) at least one vertically oriented transverse divider wall portion integral with said bottom portion, integrally connected at its two transverse ends to said inside edge portion, and extending along the vertical axis a substantial distance, said divider wall portion being further characterized by:

(i) having double vertically extending walls each integrally connected at the bottom end thereof to said bottom portion and integrally connected to each other at the top end thereof with an integral top rounded surface, and

(ii) being substantially shorter along the vertical axis than said outside edge portion, whereby at least two seamless parts storage compartments are collectively defined by said bottom, transverse divider wall portion and inside edge portion, said compartments being further characterized by all upper edges thereof being integral rounded surfaces, and whereby said storage container is free standing and self-supporting within said rectangular rim and on top of said bottom portion of said one of said trays.

4,648,525

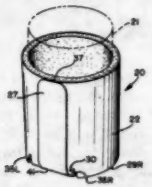
FOLD-UP INSULATED BEVERAGE CONTAINER HOLDER WITH A STABILIZING SUPPORT BASE

Scott R. Henderson, 5025 Eagle Pass, Plano, Tex. 75023

Filed Oct. 2, 1985, Ser. No. 783,096
Int. Cl.[4] B32B *3/26*
U.S. Cl. 220—85 H **10 Claims**

1. A fold-up insulative beverage container holder with an open top and a stabilizing support base comprising: a sheet form of insulative material with a substantially rectangular body portion that when transverse ends thereof are fastened together and a cylindrical beverage container is held thereby

assumes the shape of a cylinder; a bottom projection from the rectangular body portion that when assembled in the finished holder forms a center bottom portion fastened at two opposite sides to said rectangular body portion that is collapsible from the cylindrical state to a flattened state when a beverage container is removed from said holder; and with said center bottom portion sized and connected to said rectangular body portion to be drawn to a position within said rectangular body portion as it assumes a cylindrical shape with insertion of a cylindrical beverage container therein such that bottom edge surface means of said rectangular body portion derive stabilizing support from any planar support surface the holder holding a beverage container is placed on; wherein said sheet form of insulative material is a die cut sheet of insulative material that is a one sided smooth plastic surface laminated sheet of insulative foam; the one sided smooth plastic surface of said die cut sheet form of insulative material is to the outside of said insula-



tive beverage container holder; said one sided smooth plastic surface is a vinyl laminated surface on said sheet form of insulative material; said foam faces the inside of said holder and said smooth outer plastic surface is a media for printing; where the transverse ends of said rectangular body portion are held together as a seam by a seam tape; said bottom projection from said rectangular body portion includes, an interconnect shank positioned between two opposite side cutouts in said rectangular body portion; and a generally rounded disk like portion approximately the size and area of a beverage container the holder is designed to hold; and wherein said rectangular body portion also includes two additional cutouts near the transverse ends ends of said rectangular body portion defining two mirror image tabs that together when said transverse ends of said rectangular body portion are held together form a connective counterpart of said shank connectable to the opposite side of said generally rounded disk like portion from the connection thereof to said shank.

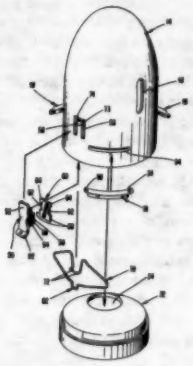
4,648,526

SAFETY CAP FOR A PRESSURIZED CYLINDER

Theodore N. Wood, Jr., Harveys Lake, Pa., assignor to The Eastern Pennsylvania Co., Inc., Wilkes-Barre, Pa.

Filed Jan. 9, 1986, Ser. No. 817,485
Int. Cl.[4] B65D *41/06*
U.S. Cl. 220—85 P **21 Claims**

1. A pressurized cylinder having a cap mounted on a valved end of said cylinder; said cylinder carrying a longitudinally facing end surface at said valved end and circumferentially extending groove means formed longitudinally inwardly and radially inwardly of said end surface so as to be defined by first and second circumferentially extending, longitudinally spaced annular surfaces; a plurality of circumferentially spaced channels formed in said end surface and extending longitudinally to intersect said groove means; said cap including a wall forming a closed end and an open end; said wall including a generally cylindrical portion disposed adjacent said open end, and a plurality of tabs projecting radially inwardly from an inner face of said cylindrical portion at a location spaced longitudinally from said open end of said cap; said tabs being circumferentially elongate and forming engagement surfaces facing said closed end; said inner face sized to fit longitudinally over said end surface; said tabs being spaced circumferentially apart so as to be longitudinally alignable with said channels and to travel longitudinally therealong and into said groove means when said cap is inserted longitudinally over said valved end; said tabs being movable circumferentially to a cap-securing position between said first and second surfaces in response to forward rotation of said cap about a longitudinal axis of said cylinder; said tabs having a thickness in the longitudinal direction which is less than the longitudinal distance between said first and second surfaces so as to be freely disposed between said first and second surfaces in said cap-securing position; said cap carrying stop means limiting rotation of said cap in forward and rearward directions of rotation; said stop means including a latch having a manually engageable portion acces-



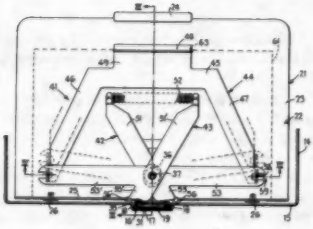
sible from the exterior of said cap, and a latching element disposed interiorly of said cap; said latching element being mounted on said wall for movement from a cap-releasing position to a cap-locking position wherein said latching element enters a recess in said end surface when said cap has been rotated forwardly to said cap-secured position for opposing rotation of said cap in said rearward direction; the combined effective circumferential lengths of said engagement surfaces of said tabs exceeding 12 percent of the circumference of said inner face of said cylindrical portion and not exceeding 50 percent thereof.

4,648,527

COMPRESSOR UNIT FOR FILING UNIT

Louis M. Chatterson, Kentwood, Mich., assignor to Haworth, Inc., Holland, Mich.

Filed May 10, 1985, Ser. No. 733,677
Int. Cl.[4] B65D *25/06*
U.S. Cl. 220—22.4 **13 Claims**



1. In combination, a file unit having a wall, and a compressor unit positioned on the file unit and selectively movably longitudinally therealong;

said wall having channel means fixedly associated therewith and extending longitudinally therealong, said channel

means defining therein a longitudinally extending channel which is accessible from the file unit through a longitudinally extending slot, said wall having flange means extending longitudinally along said slot;

said compressor unit including

(a) a compressor body positioned on and extending transversely of said file unit,

(b) a holding plate positioned within said channel and interconnected to said compressor body for movement therewith longitudinally of said file unit, said holding plate having a first friction surface thereon for engagement with a surface of said flange means,

(c) a pressure plate positioned adjacent said wall and interconnected to said compressor body for movement therewith longitudinally of said file unit, said pressure plate having a second friction surface for engaging said wall or said flange means, said first and second friction surfaces facing in opposite directions,

(d) means coacting between said holding and pressure plates for permitting relative slidable displacement therebetween in a direction substantially perpendicular to the elongated direction of said channel, said plates being relatively slidable between released and clamping positions, and

(e) spring-biased link means coacting between said holding and pressure plates for normally urging said plates into said clamping position, said spring-biased link means including a scissor-type linkage defined by a pair of pivotally-connected links which are relatively pivotal about a pivot axis which extends in substantially parallel relationship to the longitudinal direction of said slot.

4,648,528

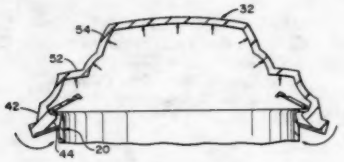
EASY OPENING CONTAINER END CLOSURE

Robert L. LaBarge, Ben Avon, and Robert E. Heffner, Lower Burrell, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 738,975, May 29, 1985, Pat. No. 4,580,692. This application Oct. 28, 1985, Ser. No. 792,106

Int. Cl.[4] B65D *53/00*

U.S. Cl. 220—240 **21 Claims**



1. A closure for closing the open mouth of a container body having contents therein from which gas dissociates, comprising:

an end wall having a portion adapted for providing an opening therein for access to the container contents;

means around the periphery of the end wall for attaching the closure to a container;

means for sealing the opening in said end wall including a low pressure sealing means effective for restricting the escape of gas at low pressures to a rate that is less than the rate at which gas dissociates from the contents so that pressure from the gas within the container progressively increases and a high pressure sealing means which is actuated and effective at a pressure which is higher than the lowest pressure at which the low pressure sealing means is effective.

4,648,529

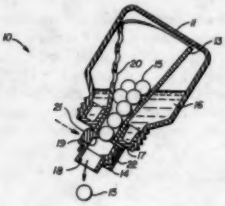
DISPENSING APPARATUS FOR STORING, DRAINING AND DISPENSING BEADS

Judith I. Blakemore, Benicia; Mark S. Hanamoto, Sausalito, and Fred G. Williams, San Anselmo, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Filed Jun. 12, 1985, Ser. No. 743,798

Int. Cl.[4] B65H *3/00*

U.S. Cl. 221—1 **31 Claims**



1. An apparatus for storing beads in a liquid medium and dispensing said beads essentially in the absence of said liquid medium comprising a threaded bottle, a container for the beads which is positioned in the interior of said bottle and contains at least one drainage port and a threaded open neck, a primary closure cap equipped with threads for the bottle, and a separate dispensing unit threaded to fit said container.

4,648,530

AUTOMATIC DISPENSER OF PRE-CUT AND Z-WRAPPED OR FOLDED WEB MATERIALS

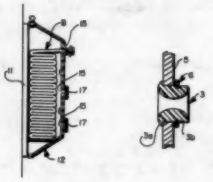
Maurice Granger, 17 rue Marcel Pagnol, 42270 Saint.Priest-en-Jarez, France

Continuation of Ser. No. 539,968, Oct. 7, 1983, abandoned. This application Jan. 9, 1986, Ser. No. 816,998

Claims priority, application France, Jul. 27, 1982, 82 13443; Oct. 15, 1982, 82 17587

Int. Cl.[4] A47K *10/24*

U.S. Cl. 221—34 **15 Claims**



1. An automatic dispenser for precut materials folded into a Z-shaped configuration, comprising a support means (1, 8 or 12) for the material having one wall having at least one rigid, non-deformable orifice (2, 3, 4, 7, 9a or 15) with a selected dimension, through which the material is pulled, so that at each pull of the material the pulled portion of the material is automatically detached, leaving a new portion of the material extending out of the orifice, the orifice is characterized in that in order to systematically assure the detachment of the pulled portion and extension of the new portion from whatever pulling force and pulling direction, the orifice extends outside of the support means, opposite the folded material, and is provided with an entry section adjacent to the folded material, an exit section opposite the entry section outside the support means, and a median section located between the entry and exit sections, the orifice has very broadly rounded and flared out entry and exit sections, while the median section is formed solely as a function of the type of material used, the support means comprises a wall attachment plate (11) to which a hood (12) having inclined faces and a bolting lock is articulated, the hood is provided with at least one orifice for the passage of at least one roll of folded material, further characterized in that the hood accommodates a plurality of rolls of folded material,

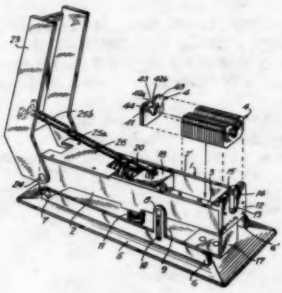
the hood is provided with a straight bottom (12*a*) for support one roll and grooves (12*b*) having removable spokes (16) which support the other rolls of folded material, and whereby each roll is provided with a separate orifice (15) wherein each orifice not provided with a roll of material passing therethrough is obturated by transparent plugs which allow the filling level to be checked.

4,648,531

DISPENSER FOR BAG CLOSURES

Yong K. Won, Seoul, Rep. of Korea, assignor to Ben Clements & Sons, Inc., South Hackensack, N.J.

Filed Mar. 5, 1985, Ser. No. 708,464
Int. Cl.[4] B65H *1/08*; B65B *61/00*
U.S. Cl. 221—232 **3 Claims**



1. A dispenser for closures having a central hole and a cut extending from a side thereof and providing access to the hole comprising:

a base member;

a housing for retaining a plurality of said closures in abutting relation with their respective holes and cuts in substantial alignment, said housing having a front and a rear, said housing being pivotably mounted at the rear thereof to said base member, said housing being formed with a first slot at the front thereof facng said base member and a second dispensing slot facing said first slot and on the side of said housing facing away from said base member;

pusher means supported on said base member positioned to pass through said first slot for dispensing the front most closure through said second dispensing slot upon the pivoting of said housing member towards said base member;

means for displacing the next closure into registration with said slots;

a front member defining the front of the housing and including a projecting portion projecting in the direction of dispensing of said closures, the front member projecting portion being of a width less than one half of the width of the second dispensing slot and being positioned on one side of and in spaced relation to the center of the width of the second dispensing slot, said housing further including a guide member spaced from said front member for defining said second dispensing slot therebetween and including a projecting portion extending in the direction of dispensing of said closures, said guide member projecting portion being of a width less than one half of the width of the second dispensing slot and being positioned on the other side of the center of the width of the second dispensing slot in spaced relation to the center of the width of the second dispensing slot; and

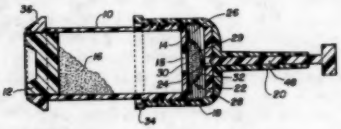
a cam means carried on the inner surface of each of the front member projecting portion and the guide member projecting portion for displacing the regions of each closure on opposed sides of the cut in opposite directions out of the plane of the closure for ease of insertion of a bag therethrough.

4,648,532

MIXING AND DISCHARGE CAPSULE

Russell D. Green, 211 NW. Front St., Apt. 2B, Milford, Del. 19963

Filed May 9, 1986, Ser. No. 861,481
Int. Cl.[4] B67B *7/48*
U.S. Cl. 222—82 **6 Claims**



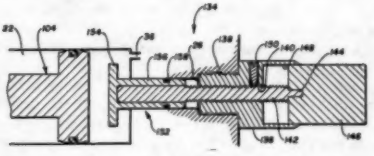
1. A combination mixing and discharge capsule comprising in combination, a body adapted to contain a first ingredient and having a piston in one end and the opposite end having a perforated wall on the body, a cap displaceably connected over the end of the body having the perforated wall and forming therewith a separate compartment, said cap having a discharge orifice in the form of a nozzle extending outwardly away from the opposite end of said body, a frangible container enclosing a second ingredient and disposed in said separate compartment with a wall oriented toward said perforated wall, means operable to displace said cap towards said piston and farther onto said body until at least the wall of the container oriented toward said perforated wall is ruptured to permit discharge of the container contents through said perforation into said container body for mixing with the ingredient therein, means operable to puncture the opposite wall of said container comprising a piercing rod initially only partially inserted into said nozzle with the inner end out of contact with said container and the inner end of said rod being extendable through said perforation in said opposite wall to effect perforation of said container, and means to move said piston into said body to engage the mixed ingredients and force the same through said discharge nozzle on said cap.

4,648,533

FLUID DISPENSING SYSTEM

Robert Rasmussen, Minneapolis, Minn., assignor to Progressive Assembly Machine Co., Inc., Plymouth, Minn.

Division of Ser. No. 532,503, Sep. 14, 1983, Pat. No. 4,610,337.
This application Apr. 22, 1985, Ser. No. 725,369
Int. Cl.[4] F15B *15/24*; B67D *5/08*; G01F *11/06*
U.S. Cl. 222—309 **5 Claims**



1. In a fluid dispensing system having a main body defining an internal cylinder cavity and a piston having a variable stroke length shiftably carried within said cylinder cavity for dispensing fluid from said system in metered amounts, the improvement comprising:

calibration means detachably, operably coupled to said body for limiting said stroke length of said piston and thereby controlling the amount of said fluid dispensed from said system, said calibration means including

structure within said main body defining a calibration means receiving channel communicating with said cylinder cavity, said channel presenting a channel sidewall and defining a channel diameter;

a first calibration member operably, detachably coupled with said body in exact, predetermined spacial relationship with said body, said first calibration member including structure defining an internally threaded bore communicating with said channel;

a second calibration member comprising a rod having an externally threaded portion complementarily, shiftably carried within said first calibration member internally threaded bore, and an end fitting receiving portion extending into said channel and defining a rod end fitting portion largest diameter; and

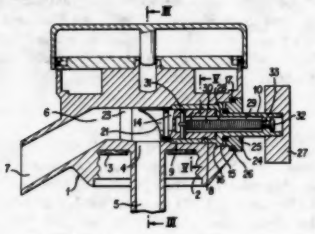
an end fitting comprising a piston abutment portion, and a sleeve portion shiftably received within said channel and shiftably carried by said second calibration member end fitting portion, said sleeve portion including sealing means for creating a fluid tight seal between said sleeve portion and said channel sidewall, said sleeve portion further having structure defining an internal, rod receiving slot, said slot having an inner diameter no smaller than said rod end fitting portion largest diameter, whereby said end fitting may be slidably removed from said rod end fitting portion such that said first and second calibration members may be attached and detached from said body while said end fitting remains within said calibration means receiving channel.

4,648,534

DEVICE FOR DISPENSING LIQUIDS

Gerhard Esser, Am Herzleiterbach 8, D-5330 Königswinter 41, Fed. Rep. of Germany

Filed Mar. 5, 1985, Ser. No. 708,585
Int. Cl.⁴ B67D *5/06*; F16K *31/56*
U.S. Cl. 222—373 **16 Claims**



1. A device for dispensing liquids which contain or are free from gas, more especially drinks containing carbon dioxide, from a container, comprising

a housing with a socket which can be fitted on to the container opening,

a riser duct in said housing which opens into the socket and to which is connected a riser extending into the container,

a dispensing duct in said housing which extends to a lateral face of the housing and is connected to said riser duct,

a valve member which is displaceable in a bore of said housing between a closed position and an open position and which has at least one laterally projecting pin and a steadily curved end face deflecting said liquid from the riser duct into the dispensing duct when the valve member is in an open position,

a cam carrier which partially encloses said valve member and is arranged to be rotatable in said bore far displacing said valve member,

at least one cam which is formed on said cam carrier and has a pitch region, said at least one pin of the valve member being held by spring force in abutment with said at least one cam, and

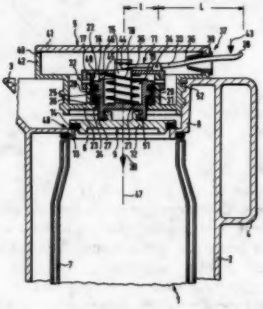
a pin support bearing for said at least one pin, said pin support bearing being provided in a pin position at an upper end of said pitch region, said valve member being axially fixed with support of its pin at said pin support bearing and being capable of axial displacement with release of its pin from said pin support bearing.

4,648,535

INSULATING JUG OF WHICH THE OPENING IS CLOSABLE BY A CLOSURE MEMBER

Anzo Zimmermann, Bad Hersfeld, Fed. Rep. of Germany, assignor to Rotpunkt Dr. Anso Zimmermann, Niederaula, Fed. Rep. of Germany

Filed Nov. 8, 1984, Ser. No. 669,616
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1983, 3342356; Jan. 27, 1984, 3402894; Apr. 2, 1984, 3412210
Int. Cl.⁴ A47G *19/4*; B65D *47/20*; B67D *3/00*
U.S. Cl. 222—472 **13 Claims**

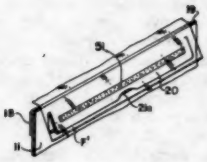


1. An insulating jug having a housing with a handle or like grip formed thereon; a connecting piece in the upper part of the housing; a hollow cap insertable into said connecting piece; a pourer formed on the housing; a pouring opening on said housing; a displaceable closure member having a guide stem, said closure member being arranged on the underside of the bottom of the cap; and a displacement mechanism with an operating member extending through the cap for vertically displacing said closure member between a closed and an open position; characterized in that a spring exerts a force on the closure member to pretension said closure member in the direction of the closed position; said displacement mechanism being actuatable to retain said closure member in the open position against the force of the spring, said operating member being automatically restorable to its closed position by the force of the spring, said operating member extending to within finger reach of the handle, the displacement mechanism and the spring being arranged in the hollow cap; a ring seal for sealing the guide stem in or on the inner side of the bottom of the cap; a stop for limiting the opening movement of the closure member, said stop comprising an annular extension projecting from the guide surface of a guide cylinder in the side of the cap; and a ring seal being arranged between the stop and a shoulder on the guide stem, said ring seal concurrently cooperating with a cylindrical surface of the guide stem and the guide surface of the guide surface in the side of the cap.

4,648,536
CARTON FOR DISPENSING SHEET MATERIAL IN ROLL FORM

Thomas VanderLugt, Kalamazoo, Mich., assignor to James River Corporation of Virginia, Norwalk, Conn.

Filed May 31, 1985, Ser. No. 739,735
Int. Cl.[4] B65D *85/671*
U.S. Cl. 225—43 5 Claims



1. A paperboard carton for dispensing sheet material from a roll of said material disposed within the carton, comprising:

at least a front planar wall including an edge over which a free end of said material extends;

a flap on said front wall folded along an upper edge, extending over an inner surface of said wall and adhered thereto along a line of adherence substantially parallel to said upper edge and spaced therefrom; and

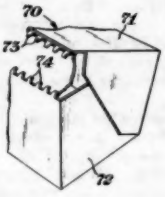
a tab in said front wall defined by a knife cut therethrough including a main portion extending substantially coextensive with said upper edge and disposed between said upper edge and said line of adherence, said knife cut further including

a pair of portions each extending from an end of said main portion transversely of its line of extent and terminating in a region between the line of adherence and said upper edge of said wall, said tab being urged pivotally outward from said front wall by the inherent resilience of the flap folded along said upper edge, said tab being provided with a tack material on the surface adjacent the free end of said material effective to engage and hold the free end of said material and urge the free end of said material away from the front wall and present it for grasping by a user.

4,648,537
DISPENSER CARTON WITH DUAL INTERDIGITATING CUTTING EDGES

Johann R. Büttig, Thalwil, Switzerland, assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 23, 1985, Ser. No. 778,956
Int. Cl.[4] B65D *85/671*
U.S. Cl. 225—43 7 Claims

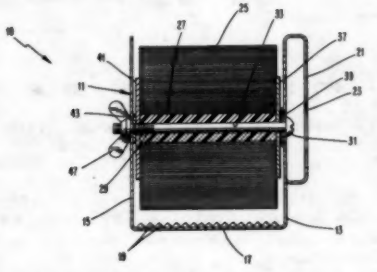


1. A dispensing carton having a generally elongate rectangular configuration and a generally square cross sectional configuration in a plane generally normal to the longitudinal axis of the container, the container comprising in cooperative combination a front wall of rectangular configuration, the front wall having a first edge and a second edge, a first end and a second end, a first connecting flap and a second connecting flap foldably affixed to said first and second ends respectively, the second side of the front panel being foldably affixed to a bottom panel, the bottom panel having a first edge foldably affixed to the second edge of the front panel, the bottom panel having a first end and second end securing flaps affixed to first end and second end respectively of the bottom panel; the second edge of the bottom panel being foldably affixed to a back panel, the back panel having a first edge and a second edge, the first edge of the back panel being foldably affixed to the second edge of the bottom panel; the back panel having a first end and a second end, first and second securement flaps affixed to the first and second ends respectively of the back panel; a top panel hingedly affixed to the back panel, the top panel having a first side and a second side, the first side of the top panel being hingedly affixed to the second side of the back panel, the top panel having a first end and a second end with first and second securement flaps affixed to the first and second ends respectively of the top panel; the top panel having foldably affixed thereto a hood panel, the hood panel having a first side and a second side, the first side of the hood panel being foldably affixed to the second side of the top panel, the hood panel having a first end and a second end and first and second securement flaps being foldably affixed to the first and second ends of the hood panel respectively; the front and bottom panels being disposed in planes which are generally at right angles to each other, the bottom and rear panel being disposed in planes generally normal to each other with the limitation that the rear panel, front panel and bottom form a generally U-shaped configuration and the first securement tabs of the front, bottom and rear panels are affixed to one another, and the second securement flaps of the front, bottom and rear panels are affixed to one another to thereby form an open topped generally rectangular configuration; the top panel and hood panel being disposed in planes which are generally normal to each other and the first securement flaps of the top and hood panel being affixed to one another and the second securement flaps of the top and hood panel being affixed to one another, the top panel being adapted to hingedly rotate about the juncture between the rear panel and the top panel to permit positioning of the hood panel over the front panel, a first serrated cutting edge affixed to a side of the hood panel remote from the top panel; a second serrated edge member affixed to the bottom panel at a location adjacent the front panel with the further limitation that when the dispensing carton is closed by positioning the hood panel generally parallel to the front panel and covering the front panel with the hood panel, the serrated edges of the bottom panel and the hood panel each defining a plurality of projecting teeth and said teeth interdigitating.

4,648,538
FLAGGING DISPENSER

Darryl A. Lien, 557 Bighorn Way, P.O. Box 673, Troy, Mont. 59935

Filed Mar. 28, 1986, Ser. No. 845,624
Int. Cl.[4] B65D *85/672*
U.S. Cl. 225—78 5 Claims



1. A flagging dispenser including:

(a) a U-shaped body;

(b) belt attachment means attached to a first leg of said body;

(c) a serrated edge on a bottom portion of said body:

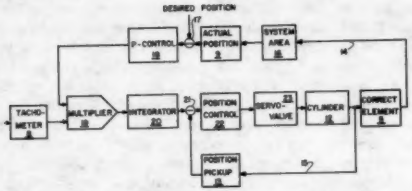
(d) a spindle connected between said first leg and a second leg of said body;
(e) a flagging roll adapted to be mounted on said spindle; and
(f) frictional braking means interposed between one of said legs and said roll and adapted to retard the rotation of said roll.

4,648,539

CONTROL DEVICE FOR GUIDING A MATERIAL WEB

Heinz-Ludwig Dingerkus, Attendorn, Fed. Rep. of Germany, assignor to Elektro-Mechanik GmbH, Fed. Rep. of Germany

Filed Feb. 27, 1984, Ser. No. 583,831
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1983, 3307499
Int. Cl.⁴ B65H *23/038*
U.S. Cl. 226—19 **11 Claims**



1. A control device for continuously controlling the position of a material web which is guided over at least one roller in a controlled area, comprising:
position correcting means engaged with the web at a first location of the controlled area to reposition the web in the controlled area;
actual position sensing means for continuously sensing the actual position of the material web in the controlled area to generate an actual web position signal;
speed sensing means for continuously sensing the speed of the web in the controlled area to generate a web speed signal;
a difference unit having a desired web position signal and connected to said actual position sensing means for obtaining a difference signal corresponding to a difference between the desired web position signal and the actual web position signal;
a multiplier connected to said difference unit and said speed sensing means for multiplying said difference signal by said web speed signal to obtain a corrected difference signal; and
circuit means connected to said multiplier and said position controlling means for controlling said position correcting means in accordance with said corrected difference signal to reposition the web.

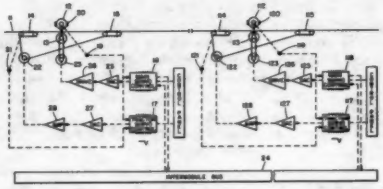
4,648,540

SIZE INDEPENDENT MODULAR WEB PROCESSING LINE AND MODULES

Leonard R. Steidel, 48 Monica Rd., Grand Island, N.Y. 14072

Continuation-in-part of Ser. No. 675,149, Nov. 27, 1984, abandoned. This application Jan. 29, 1985, Ser. No. 695,963
Int. Cl.⁴ B65H *20/24*
U.S. Cl. 226—111 **15 Claims**

11. A web processing module capable of performing a web processing operation in variable locations on variable lengths of web comprising:
a tool means for performing a web processing operation on the web;
tool drive means for driving the tool means;
web conveying means for conveying the web past the tool means;
web conveying drive means for driving the web conveying means;
control means for controlling the tool drive means and the web conveying means to coordinate the web conveying means to the tool means over a range of variable web processing operation locations and a range of variable lengths of web and
in which the tool means constitutes a tool, the tool drive means includes an electrical tool drive motor operatively connected to the tool, the web conveying means constitutes tractors, the web conveying drive means includes a tractor drive motor and a drive linkage operatively connecting the tractors and the tractor drive motor,
the module further comprising a tool encoder for generating tool positional information and a web tractor encoder for generating web positional information,
and further in which the control means constitutes an electronic, digital, computer controller electronically, operatively connected to the tool drive motor, the tractor drive motor, the tool encoder and the tractor encoder,
the controller including a control panel, an intermodule bus, a main servo control microprocessor system and a tractor servo control microprocessor system,
the tractor servo control microprocessor system including memory with information to coordinate the tractors with



the tool such that the web processing operations can be performed in the variable locations on the variable lengths of web,
the control panel accepting manually input operating parameters including web throughput, number and locations of desired web processing operations, and desired web length of repetition of the desired web processing operations,
the tractor servo control microprocessor generating, from the information in memory, profiles for control of the tractors according to the manually input operating parameters,
the main servo control microprocessor system and the tractor servo control microprocessor system receiving tool positional information from the tool encoder,
the tractor servo control microprocessor system receiving web positional information from the tractor encoder,
the main servo control microprocessor utilizing the tool positional information as feedback to accurately control the tool,
the tractor servo control microprocessor utilizing the web positional information as feedback to accurately control the tractors, and
the tractor servo control microprocessor utilizing the tool positional information for coordinating the movement of the tractors to the movement of the tool.

4,648,541

BONE STAPLER

Douglas R. Mongeon, Orange, Calif., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Dec. 9, 1985, Ser. No. 806,759
Int. Cl.⁴ A61B *17/00*
U.S. Cl. 227—19 **9 Claims**

1. In a bone stapler adapted for use with generally U-shaped

staples each comprising a central portion and two generally parallel leg portions projecting generally in the same direction from opposite ends of its central portion and having distal ends, said stapler comprising:

a barrel assembly including:

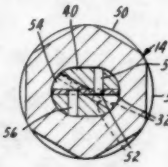
a first housing part having a passageway extending from an inlet opening to an outlet opening, said passageway being adapted to guide a single staple moved from the inlet to the outlet opening with the distal ends of its legs leading, and defining a socket adapted to releasably receive a cartridge containing staples at said inlet opening; and

an elongate driver having an axis, an inner end portion, and an opposite contact end portion adapted to engage the central portion of said staple, said driver being mounted on said first housing part for longitudinal sliding movement between a load position with the driver spaced from the socket and inlet opening to afford movement of one of the staples into the passageway, along said passageway with said contact end portion pushing the staple, to an eject position at which the contact end portion of the driver pushes the staple out said outlet opening while restricting rotation of said driver relative to said first housing part;

a handle assembly including:

a second housing part; and

drive means including a piston assembly having an axis, mounted on said second housing part, and adapted to be manually activated for moving said piston assembly between first and second positions; and



means for releasably attaching together said barrel assembly and said handle assembly including means for releasably attaching together said first and second housing parts and for releasably attaching together said piston assembly and the inner end portion of said driver so that movement of said piston assembly between said first and second position will cause corresponding movement of said driver between said load and eject position to move said staple from said inlet to said outlet opening; the improvement wherein:

said inner portion of said driver is plate-like, has an end surface, and has at least one opening spaced from said end surface;

said piston assembly includes an end portion having walls defining a transverse slot receiving the inner end portion of said driver, and having at least one pin projecting from one of said walls into said slot at a position spaced from the axis of said piston assembly and in a direction generally normal to the axis of said piston assembly, said slot being shaped to afford rotational movement of said inner end portion of said driver about said axis within said slot between a release position with said pin spaced from said opening, and an engaged position with said pin positioned within said opening to provide said means for releasably attaching together said piston assembly and driver;

said second housing part includes a first housing portion guiding the end portion of said piston assembly for movement between said first and second positions while preventing relative rotation between said handle portion and said end portion of said piston assembly;

said means for fastening together said first and second housing parts comprises structures on said housing parts adapted to be engaged at an engage position at which said inner end portion of said driver is positioned in said slot in said release position of said driver, and to then be relatively moved to a lock position at which said housing parts can not be moved in the axial direction of said driver and piston assembly to thereby move said inner end of said driver and said end portion of the piston assembly to said engaged position; and

means for releasably retaining said housing portions in said lock position.

4,648,542

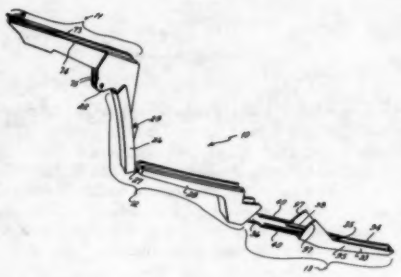
DISPOSABLE STAPLER

William D. Fox, and William M. Mereness, both of Cincinnati, Ohio, assignors to Senmed, Inc., Cincinnati, Ohio

Filed Nov. 1, 1985, Ser. No. 793,955

Int. Cl.[4] A61B *17/00*

U.S. Cl. 227—19 **54 Claims**



1. In a stapler having a staple guide passage wherein staples are sequentially engaged by a driver and are formed against an anvil,

a supply of staples positioned to be fed into said passage for engagement by said driver,

a feed spring biasing said supply toward said passage, and

a supplementary spring movable into engagement with said feed spring to supply additional force thereto when said driver is moved to engage a staple from said supply.

6. An elongated molding for assembly into a stapler, said molding comprising,

a body section at one end,

a trigger section presenting a trigger at an opposite end, and

a handle section between and interconnecting the body and trigger sections,

said trigger presenting a body aperture sufficiently wide for the body section to be inserted into it,

the handle section including a portion which can be flexed to permit the trigger to be brought forwardly over the front end of said body section and the body section inserted into said aperture so that said trigger extends obliquely to the body section,

said handle section in use forming a pistol grip by which the stapler is held.

4,648,543

DEVICE FOR SOLDERING AN ELEMENT TO A PRINT PLATE

Eggert Herrmann, Gauting, Fed. Rep. of Germany, assignor to Weld-Equip b.v., Helmond, Netherlands

Filed Jun. 13, 1984, Ser. No. 620,128

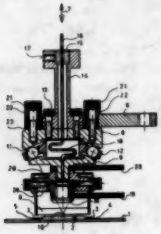
Claims priority, application Netherlands, Jun. 24, 1983, 8302262

Int. Cl.[4] B23K *3/04*

U.S. Cl. 228—6.2 **7 Claims**

1. In a device for soldering an element having a plurality of laterally projecting, substantially coplanar connecting wires to a print plate, such device comprising: a bracket holder capable

of performing movement in a direction substantially perpendicular to the surface of the print plate; a soldering bracket supported by the bracket holder and heated by electric current, for substantially simultaneously pressing the connecting wires to connection spots on the print plate and soldering the wires thereto during movement of the bracket holder; said bracket holder comprising a first part affixed to the soldering bracket and a second part affixed to a mechanism for producing move-



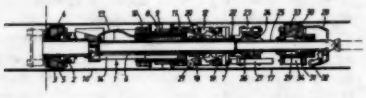
ment of the bracket holder; the improvement characterized in that said first and second parts of said bracket holder have concentric spherical surfaces, and said device further comprises a tensioned spring located between and fastened to said parts which exerts a tensile force thereon radially to said spherical surfaces; whereby said spherical surfaces are brought to bear against each other substantially solely by the radial force exerted thereon by said tensioned spring.

4,648,544

INTERNAL CHUCK FOR BUTT WELDING TWO TUBES

Xavier F. Puissais, Levallois Perret; Jean-Pierre Hamon, Cergy; Michel Jégousse, Saint-Herblain, and Michel Kaluszynski, Vitry-Sur-Seine, all of France, assignors to Total Compagnie Francaise des Petroles, Paris, France

Filed Oct. 9, 1985, Ser. No. 785,650
Claims priority, application France, Oct. 22, 1984, 84 16112
Int. Cl.[4] B23K *37/00*
U.S. Cl. 228—44.5 **3 Claims**



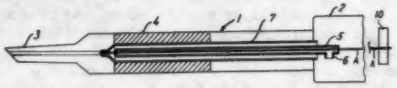
1. An internal chuck for use in the butt joining of two tubes (16, 17) by welding together abutting ends of the tubes, said chuck comprising an assembly of generally tubular shape provided with first gripping means (2) adapted to grip internally one of the tubes (16), second gripping means (28, 33) adapted to grip internally the other tube (17), means (30, 31) for relatively longitudinally displacing said tubular assembly and said second gripping means, said tubular assembly including a central tube (6) fixed relative to a remainder of said assembly, a sleeve (7) slidably mounted on the central tube and carrying centering means (12) adapted for radial extension for internal application against the tubes, welding backup means (8) for supporting a welding process, said centering means and said welding backup means being longitudinally spaced from one another, and jack means (27) for longitudinally displacing said sleeve relative to said central tube.

4,648,545

SOLDERING IRON

Birger H. Polckemann, 17, Midgårdsvej, DK-3000 Helsingor, Denmark

Filed Jul. 11, 1985, Ser. No. 753,962
Claims priority, application Denmark, Jul. 24, 1984, 3626/84
Int. Cl.[4] B23K *3/02, 3/06*
U.S. Cl. 228—53 **10 Claims**



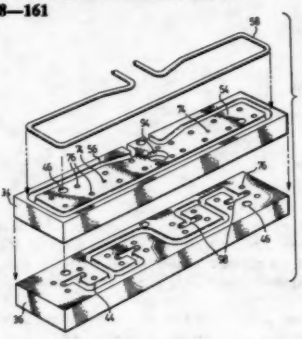
1. A soldering iron of the type in which the solder is fed through the interior of the iron to the soldering tip, which is heated by a heating element in the soldering iron, wherein means are provided for actively supplying a distinct coolant under pressure, said coolant flowing through the interior of the soldering iron around the solder, at least in the area which comprises the heating element.

4,648,546

COMPOSITE PLATE METHOD OF MANUFACTURING INJECTION MOLDING MANIFOLD

Jobst U. Gellert, 7A Prince Street, Georgetown, Ontario, Canada (L7G 2X1)

Filed Apr. 22, 1985, Ser. No. 725,799
Claims priority, application Canada, Apr. 9, 1985, 478674
Int. Cl.[4] B23K *1/12, 1/04*
U.S. Cl. 228—161 **8 Claims**



1. A method of manufacturing a composite injection molding manifold having a tortuous melt passage with several branches to convey melt from a common inlet opening to a plurality of aligned outlet openings, and an electrically insulated electrical heating element extending therein with at least one terminal end projecting therefrom; comprising the steps of:

(a) forming two plates of tool steel having matching opposed surfaces;

(b) machining matching grooves in the opposed surfaces of the plates, the grooves having bends which are smoothly curved to facilitate flow;

(c) securing the two plates together with the opposed surfaces abutting in a position wherein the matching grooves form the melt passage to improve flow of the melt therethrough;

(d) forming a channel in the upper external surface of the composite plates and locating the electrical heating element in the channel with at least one terminal end of the heating element extending from the channel, the heating element being secured in a predetermined position in the channel whereby a space is provided surrounding the heating element in the channel;

(e) locating a filler tube with an open mouth and a base on the said upper surface with the base communicating with the channel;

(f) sealing the channel around the said projecting terminal end of said electric heating element so as to seal the channel against substantial leakage and fixing the filler tube to the said upper surface;

(g) inserting a predetermined quantity of highly conductive material into the filler tube;

(h) heating the assembled unit in a vacuum furnace for a sufficient period of time under a partial vacuum and at a temperature whereby the highly conductive material is melted and flows into the continuous space around the heating element in the channel to form a metallurgical bond between the heating element and the highly conductive material and between the channel and the highly conductive material, and whereby highly conductive material provided between the abutting surfaces of the plates brazes the plates together and seals the melt passage against leakage; and

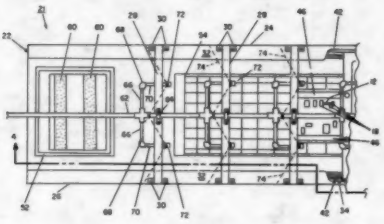
(i) machining off the filler tube.

4,648,547

METHOD AND APPARATUS FOR ACHIEVING REDUCED COMPONENT FAILURE DURING SOLDERING

James A. Mahler, East Windsor Township, Mercer County, N.J., and Gregory C. Munie, Lower Makefield Township, Bucks County, Pa., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Jun. 26, 1985, Ser. No. 749,045
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—180.1 **6 Claims**



1. A method of soldering device leads, passing through apertures in a substrate, to land areas located about said apertures on the bottom surface of said substrate, the method comprising the steps of:

contacting a lead and a land area with molten solder; while simultaneously directing a gas along the upper surface of the substrate against the lead in contact with the molten solder to reduce the incidence of corrosion to the lead by corrosive vapors.

4,648,548

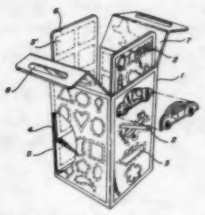
BOX WITH REMOVABLE DECORATIVE FIGURES

Sang J. Shin, 265 Sangdo 4-Dong, Dongjak-ku, Seoul, Rep. of Korea

Filed Nov. 1, 1985, Ser. No. 793,749
Int. Cl.[4] B65D *5/00*
U.S. Cl. 229—8 **4 Claims**

1. A container having a paper cardboard construction and paper board inserts therefor for protecting the container contents from mishandling and shock which comprises providing the walls of said container with decorative figures defined by perforations disposed in the surfaces thereof,

an adhesive coated transparent plastic sheet adhered to the inside surface of said walls of the container, said adhesive coated plastic sheet provided with perforations corresponding to those of the decorative figures so that when the decorative figures containing the plastic sheet are removed from the container along said perforations, the decorative figures can be used as individual ornaments or the plastic sheet can be separated from the decorative figures leaving residual adhesive on said decorative figures for adherence to a surface, and



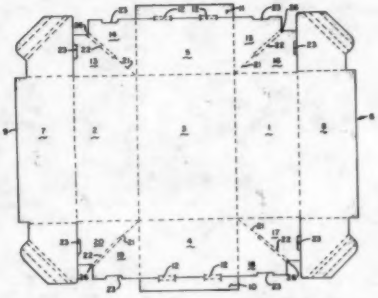
said paper board inserts having the same construction and decorative figures as the walls of the container.

4,648,549

SELF-LOCKING CONTAINER

Maynard A. Trutna, Orange Park, Fla., assignor to Jefferson Smurfit Corporation, Alton, Ill.

Continuation of Ser. No. 723,791, Apr. 16, 1985, abandoned. This application Mar. 17, 1986, Ser. No. 840,538
Int. Cl.[4] B65D *5/24*
U.S. Cl. 229—143 **6 Claims**



1. A self-locking container of the type incorporating a pair of side walls, and a pair of end walls, all integrally and foldably connected to a bottom wall to form a container body, a series of bellows flaps at each corner of the folded container body interconnecting intermediately each adjacent side and end wall together, said bellow flaps capable of folding into contiguity and further folding into overlying relationship against the adjacent end wall, a connecting flap foldably connecting along the upper edge of each end wall and disposed for folding over upon the bellows flaps to secure the wall and said bellows flaps into the container body form, each connecting flap incorporating tabs securing each of said flaps to its respective end wall, each series of bellows flaps when folded over ito the container configuration disposing upper edges, each disposed upper edge having at least one cut out portion, and said connecting flap tabs upon each end wall arranged for disposition within said bellows flaps cut out portions to maintain the container body into its folded form, a cover integrally connecting with and provided for the container body, said cover having end flaps, at each end, and disposed for interlocking with the approximate bellows flaps of the container body to secure said self-locking container into closure, said bellows flaps at each corner disposing an angulated edge extending from a lower outer portion of the end wall and inclined upwardly towards a central upper portion of the said end wall, said end flaps of the

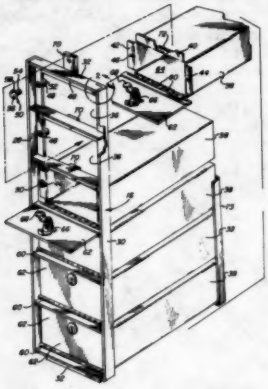
cover having angled portions aligned with the angulated edges of the bellows flaps, and said angled portions of the end flaps of the cover disposed for tucking under and extending adjacent to the approximate angulated inclined edges of the bellows flaps along substantially the length of and contiguous with the angulated edges of said bellows flaps when securing said container into closure.

4,648,550

TAMPERPROOF MAILBOX ASSEMBLY

Vincent J. Cleary, Jr., Bridgeport, Conn., assignor to Cynthia A. Cleary, Bridgeport, Conn.

Filed Aug. 28, 1985, Ser. No. 770,407
Int. Cl.[4] B65D *91/00*
U.S. Cl. 232—25 **9 Claims**



1. A tamperproof mailbox assembly consisting of a horizontal and vertical array of individual mailboxes comprising:

a series of side-to-side abutted module frames for receiving a plurality of said mailboxes in a vertically stacked configuration, each frame including;

a pair of upright, parallel angle iron members and a plurality of horizontal cross pieces connecting said upright angle iron members at spaced locations along the length thereof,

each of said cross pieces of said module frames being formed from an angle iron member notched at opposed ends thereof to receive one of the legs of said upright angle iron members,

one of the legs of each of said upright angle iron members being spaced rearwardly from the front edge of the other leg of each of said upright angle iron members and providing a recessed support frame along with a downwardly extending leg of one of said cross pieces for receiving and supporting one of said mailboxes, and

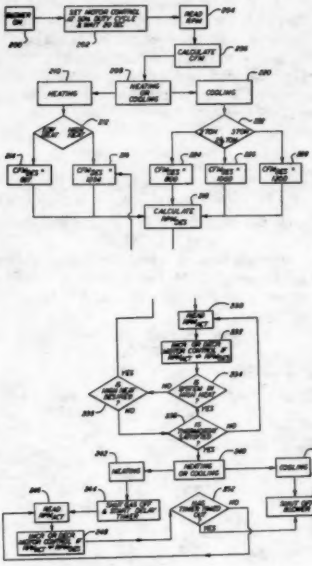
each of said mailboxes having a first opening in the front surface thereof and a second opening opposite thereto allowing mail to be placed in or retrieved from each mailbox at opposite ends and including outwardly extending flange members about said first opening adapted to be secured to said recessed legs of each of said upright angle iron frame members and a downwardly extending leg of one of said cross pieces, each of said mailboxes further including a first door pivotably connected to a panel thereof for selectively covering said first opening.

4,648,551

ADAPTIVE BLOWER MOTOR CONTROLLER

Kevin D. Thompson; Gary W. Ballard, both of Indianapolis, and Robert M. Mamot, Plainfield, all of Ind., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jun. 23, 1986, Ser. No. 877,613
Int. Cl.[4] F24F *7/00*
U.S. Cl. 236—49 **2 Claims**



1. An adaptive motor control for regulating an ECM driven circulating air blower for each thermostat cycle comprising the steps of:

sensing the temperature in an area to be conditioned;

comparing the sensed temperature to a predetermined set point;

if the sensed temperature deviates from the predetermined set point by more than a predetermined amount, operating the ECM at a predetermined duty cycle for a sufficient time for stabilization;

determining the RPM:

determining the CFM:

determining whether heating or cooling is required;

if heating is required, determining whether high or low heat is required;

if cooling is required, determining the amount of cooling required:

selecting the desired CFM for the required heating or cooling;

determining the desired RPM for the selected desired CFM;

determining the actual RPM;

adjusting the speed of the ECM if the actual and desired RPM are not the same;

determining whether the thermostat is satisfied;

if the thermostat is not satisfied, returning to the step of determining the actual RPM;

if the thermostat is satisfied, determining whether the system is in the heating or cooling mode,

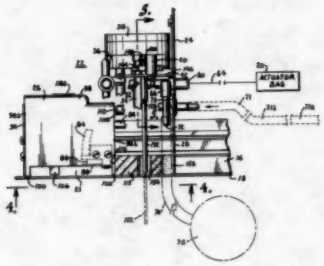
if in the cooling mode, shutting off the blower; and;

if in the heating mode, shutting off the gas and then shutting off the blower after a predetermined time.

4,648,552
CONTROL INSTALLATION FOR VARIABLE VOLUME AIR DIFFUSERS

Melvin C. Carlson, 9915 N. Campbell, Kansas City, Mo. 64155, and Raymond H. Dean, 6034 Mission Dr., Shawnee Mission, Kans. 66208

Filed Mar. 10, 1986, Ser. No. 837,888
Int. Cl.[4] F24F 7/04
U.S. Cl. 236—49 16 Claims



1. In an air distribution system having a duct for receiving conditioned air, a plenum for receiving air from the duct, a diffuser having an outlet slot for discharging air from the plenum into a conditioned space, pressure responsive actuator means for controlling the passage of air from the duct into the plenum, a pneumatic control circuit for controlling said actuator means, and a sensor line in said control circuit for transmitting an air velocity signal thereto, the improvement comprising:

a generally transverse bulkhead on said plenum presenting a control compartment adjacent the plenum and separated therefrom by said bulkhead, said control compartment housing said pneumatic circuit and sensor line and presenting a slot arranged as an extension of the diffuser slot;

a sensor conduit in the plenum having at least one opening therein for sensing the velocity of air discharging through the diffuser slot; and

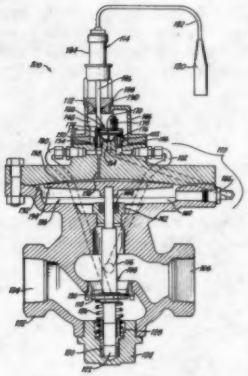
Tee fitting having a first leg extending through said bulkhead and connected with said sensor conduit and a second leg connected with the sensor line to transmit the sensed air velocity signal thereto, said Tee fitting having a third leg extending generally along said bulkhead and having a lower end presenting a port adjacent the bulkhead at a location recessed above the control compartment slot to permit a tube to be extended through said slot and guided along the bulkhead onto the lower end of said third leg for monitoring of the velocity signal.

4,648,553
REGULATING VALVE

John T. Muller, Morris Plains, N.J., assignor to Leslie Company, Parsippany, N.J.

Filed Jul. 9, 1985, Ser. No. 753,189
Int. Cl.[4] G05D 23/00
U.S. Cl. 236—80 R 25 Claims

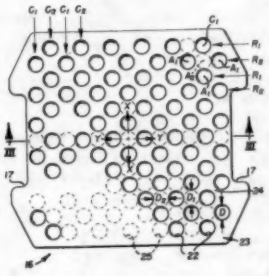
1. A valve for controlling the flow of a fluid in response to a sensed condition, said valve comprising a body having a body inlet and a body outlet through which a fluid to be regulated flows, regulating means within said body for regulating the flow of said fluid between a first and a second state, sensing means for sensing a condition to be controlled by regulating the flow of said fluid between said states, control means for controlling said regulating means in response to said sensing means, and adjusting means for adjusting said control means such that said fluid is maintained by said regulating means at one of said states upon said sensing means becoming inoperative, said adjusting means comprising a lever including a channel extending therethrough and having a lever inlet and a lever outlet, said lever inlet closed by a portion of said sensing means when said sensing means is operative and opened when said sensing means is inoperative, said lever inlet in fluid communication with said body inlet and said lever outlet in fluid communication with said body outlet when said lever inlet is opened, whereby said fluid from said body inlet flows through said channel to said body outlet such that said regulating means in response to said control means permits the flow of said fluid through said body.



4,648,554
IMPACT AND VIBRATION ATTENUATING PAD WITH OFFSET DIMPLES

Phillip J. McQueen, Ignacio, Calif., assignor to Acme Plastics, Inc., Indiantown, Fla., a part interest

Filed Oct. 30, 1984, Ser. No. 666,442
Int. Cl.[4] E01B 9/68
U.S. Cl. 238—283 20 Claims



1. A generally flat, impact and vibration attenuating pad for railways, entirely composed of the same elastomeric material and disposed in a horizontal plane, for attenuating dynamic impact and vibrational loads imposed thereon when placed between a railroad tie and a steel rail, comprising

a plurality of spaced apart first dimples formed in a generally regular pattern on a first side of said pad and interconnected by a plurality of first flat portions, and

a plurality of spaced apart second dimples formed in a generally regular pattern on an opposite second side of said pad and interconnected by a plurality of second flat portions, each of said first and second dimples having arcuate shapes throughout its various cross-sections and centers of

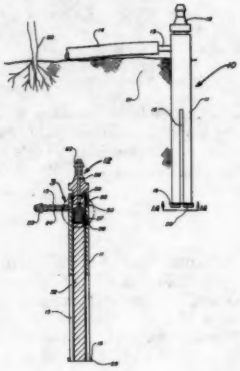
said first dimples being offset longitudinally and laterally relative to centers of said second dimples such that a majority of said second dimples underlies and is substantially tangential relative to four overlying first dimples when said pad is viewed in plan to form means, defining a network of interlocked arch bridge portions when said pad is viewed in cross-section, for redirecting impact loads, resulting from dynamic loading, imposed on said pad in a vertical plane, perpendicular to said horizontal plane, radially into said horizontal plane and as compressive stresses distributed substantially uniformly throughout and within the elastic limits of said pad.

4,648,555

IRRIGATION DEVICE

Joseph Gumbmann, Jr., P.O. Drawer G, Burney, Calif. 96013

Filed Nov. 18, 1985, Ser. No. 798,877
Int. Cl.[4] B05B *12/12*
U.S. Cl. 239—63 **4 Claims**



1. A moisture-responsive irrigation device, comprising:

a housing constructed of substantially tubular hollow material having:

a top end;

a bottom end;

a wall, and

a slot cut through said wall extending from said bottom end of said housing to a point substantially midway between said top end and said bottom end of said housing;

a valve positioned at said top end of said housing having an inlet and an outlet;

a moisture-sensitive element positioned inside said housing and having a top end and a bottom end, oriented so that said bottom end of said moisture-sensitive element is positioned substantially at said bottom end of said housing, and said top end of said moisture-sensitive element is positioned near said top end of said housing in operative contact with said valve so that, as said moisture-sensitive element expands in response to increased moisture, it exerts pressure on said valve, closing said valve, and

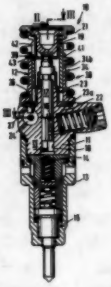
retaining means consisting substantially of a retaining ring positioned about and near said bottom end of said hosing which exerts pressure on said wall of said housing whereby said bottom end of said housing compresses, holding said bottom end of said moisture-sensitive element substantially rigidly with respect to said bottom end of said housing.

4,648,556

PUMP/NOZZLE UNIT FOR FUEL INJECTION IN INTERNAL COMBUSTION ENGINES

Jean Leblanc, Lyons; Jean Pigeroulet, Villeurbanne, and Francois Rossignol, Mornant, all of France, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 13, 1984, Ser. No. 630,908
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1983, 3327398; Mar. 28, 1984, 3411406
Int. Cl.[4] F02M *57/02*
U.S. Cl. 239—88 **13 Claims**



1. A pump/nozzle unit secured to an engine housing for fuel injection in internal combustion engines comprising:

a pump housing that receives a piston injection pump and including an injection nozzle at one end thereof;

a pump piston which is rotatably and axially guided in a cylindrical bore in said housing in order to vary the effective supply stroke, by means of a regulating sleeve disposed coaxially therewith and by means of a supply quantity adjusting member engaging the regulating sleeve via a drive device, said pump piston being actuatable via a drive tappet counter to the force of a tappet spring;

a first spring support, located on said drive tappet, and a second spring support, relieved toward the pump housing, for supporting said tappet spring;

a guide bushing secured on the pump housing and provided with a sleeve-like guide part for said drive tappet said guide bushing including an end face side forming an axial positional securing means for said pump piston regulating sleeve;

a securing flange located on said pump housing, said securing flange having an end face on said drive side of said housing engaged at least indirectly by a securing means which secures the pump/nozzles unit to the engine housing;

said guide bushing provided with a bushing flange radially protruding beyond an outer diameter of said tappet spring and extending into a set region of said end face, said end face of said flange rests on said end face on the drive side of the pump housing;

said bushing flange of said guide bushing is secured on said pump housing by means of a holder means and said securing means, and clamped against said end face on said securing flange;

said second spring support of the tappet spring is embodied by an annular shoulder on said guide bushing; and

said guide part of said guide bushing and said drive tappet are equipped with loss-preventing means, by means of which at least said guide bushing, said drive tappet and said tappet spring are combined into a drive assembly unit which is also held together in a demounted state after holder means being removed from pump housing.

4,648,557

TRANSPORT SYSTEM FOR MATERIAL IN POWDER OR LIKE FORM

Michael J. R. Young, Ashburton, England, assignor to General Dispensing Systems Limited, London, England

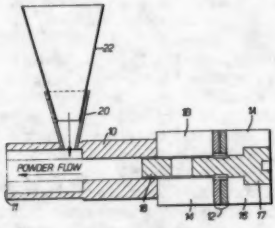
PCT No. PCT/GB84/00337, § 371 Date May 16, 1985, § 102(e) Date May 16, 1985, PCT Pub. No. WO85/01494, PCT Pub. Date Apr. 11, 1985

PCT Filed Oct. 4, 1984, Ser. No. 737,350

Claims priority, application United Kingdom, Oct. 4, 1983, 8326533

Int. Cl.[4] B05B 3/14

U.S. Cl. 239—102.2 6 Claims



1. A transport system for material in powdered, particulate, granular or the like form, comprising a body; flow channel means for guiding the material, said channel means being within the body, and in use, generally horizontally disposed; an inlet to said channel means for receiving said material; said channel means terminating at an outlet from said channel means for dispensing said material; said outlet being spaced from said inlet; and an ultrasonic transducer coupled to said body and arranged to establish an ultrasonic standing wave having a node substantially at the outlet, and an antinode substantially at the inlet, so as to displace material along said channel means from said inlet to said outlet, said inlet and outlet being spaced one from the other substantially by one quarter of a wavelength of the ultrasonic standing wave.

4,648,558

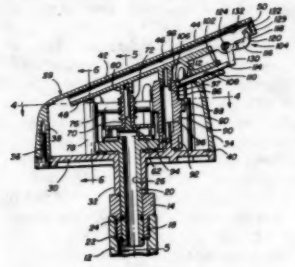
SPRINKLER ASSEMBLY

Benjamin F. Rabitsch, P.O. Box 1062, Millen, Ga. 30442

Filed May 9, 1985, Ser. No. 732,178

Int. Cl.[4] B05B 3/04, 3/10

U.S. Cl. 239—228 13 Claims



9. A discharge nozzle for liquid material having a longitudinally extending passageway communicating a source of liquid with a discharge end of the nozzle and diffuser means associated with the liquid passageway in the nozzle to determine the pattern of discharge of liquid from the nozzle, said diffuser means including a blade inserted into the liquid passageway to split the stream of liquid as it discharges from the nozzle, said blade being inserted laterally of the nozzle into intersecting relation to the stream of liquid passing therethrough, the inner surface of the passageway in opposed relation to the blade including a radiused groove through which some of the liquid passes when the blade is in intersecting relation to the stream of liquid due to back pressure caused by the blade whereby the liquid material passing through the groove then passes across the path of the stream of liquid to diffuse the stream of liquid and vary the pattern of discharge of the liquid from the nozzle.

4,648,559

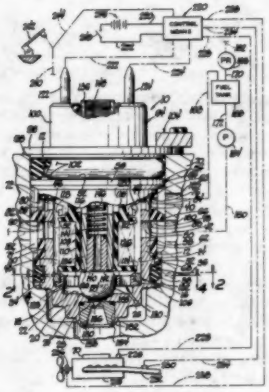
ELECTROMAGNETICALLY ACTUATABLE FLUID VALVE

William A. Fuller, St. Clair Shores, Mich., assignor to Colt Industries Operating Corp, New York, N.Y.

Filed Nov. 4, 1985, Ser. No. 794,450

Int. Cl.[4] F02M 51/06

U.S. Cl. 239—585 21 Claims

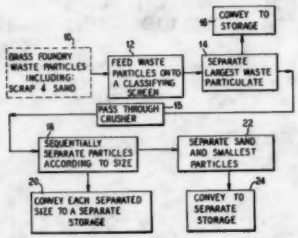


1. A valving assembly for metering the rate of flow of a fluid, comprising housing means, electrical field coil means carried by said housing means, pole piece means situated generally within said field coil means, valve seat means, fluid flow passage means formed through said valve seat means, said pole piece means comprising a pole piece axial end portion, a valve member situated generally between said pole piece means axial end portion and said valve seat means, wherein said valve member also serves as an armature means to be acted upon by the flux field generated by said field coil means when energized, resilient means normally operatively resiliently urging said valve member in a first direction toward operative seating engagement with said valve seat means as to thereby terminate flow of said fluid through said fluid flow passage means, wherein said field coil means when energized creates said flux field causing said valve member to move in a second direction opposite to said first direction away from said valve seat means as to thereby permit flow of said fluid through said fluid flow passage means, guide means physically separate from but operatively carried by said housing means, said guide means closely confining said valve member as to allow said valve member to be freely moved in said first and second directions while effectively limiting movement of said valve member in directions transverse to said first and second directions, said guide means being moveable with respect to said housing means in directions transverse to said first and second directions to a selected location, and means for locking said guide means in said selected location as to thereby assure that said guide means properly guides said valve member to a seated condition against said valve seat means.

4,648,560
SCREEN SEPARATOR METHOD FOR FOUNDRY WASTE MATERIALS

Thomas E. Rolle; David J. Nebel; John L. Shulan, and William P. Liljestrom, all of Dubuque, Iowa, assignors to T.D.J. Co., Inc., Dubuque, Iowa

Filed Jun. 25, 1985, Ser. No. 748,626
Int. Cl.[4] B02C *19/12*
U.S. Cl. 241—24 **5 Claims**


CONVEY TO STORAGE
BRASS FOUNDRY WASTE PARTICLES INCLUDING: SCRAP & SAND
FEED WASTE PARTICLES ONTO A CLASSIFYING SCREEN
SEPARATE LARGEST WASTE PARTICULATE
PASS THROUGH CRUSHER
SEQUENTIALLY SEPARATE PARTICLES ACCORDING TO SIZE
SEPARATE SAND AND SMALLEST PARTICLES
CONVEY EACH SEPARATED SIZE TO A SEPARATE STORAGE
CONVEY TO SEPARATE STORAGE

1. A dry separator method of classifying non-homogeneous waste by-products from a brass foundry including valuable brass materials, scrap materials and and in order to concentrate valuable recyclable materials such as said brass materials and separate them from less valuable materials comprising:

feeding said non-homogeneous by-products onto a first classifying screen with a mesh size of approximately 6 inches to separate large less valuable waste particles which are conveyed to a storage location and thus concentrate the valuable recyclable materials,

sequentially separating the remaining non-homogeneous materials through additional screens with progressively smaller screen openings wherein a final screen has a mesh size of no more than ¼ inch,

separately collecting the concentrated valuable recyclable materials from each classifying screen,

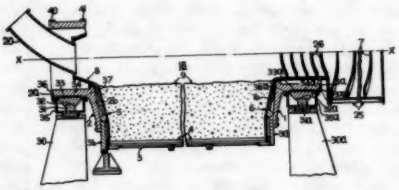
conveying each collected group of materials to a discrete storage location, and

conveying the smallest particles which have passed through all of the classifying screens and which comprise less valuable materials, to a discrete storage location.

4,648,561
GRINDING MILL APPARATUS

Raymond C. Jenness, Delafield, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 2, 1985, Ser. No. 761,996
Int. Cl.[4] B02C *25/00*
U.S. Cl. 241—34 **4 Claims**



1. A grinding mill apparatus comprising components which include:

(a) a cylindrical mill shell (3) arranged with a central axis (X—X) therethrough being generally horizontal and said shell having a material feed end and a material discharge end with each said end enclosed by a head plate (1, 2), a trunnion (1*a*, 2*a*) projecting axially outward from each head plate and defining a passage extending centrally therethrough;

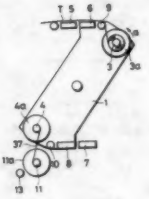
(b) a support bearing assembly for each trunnion bearing (1*a*, 2*a*) with each bearing assembly having a base (31, 31*a*) for mounting on a stationary support structure (30, 30*a*), an insert (33) between each said base (31, 31*a*) and each said trunnion (1*a*, 2*a*) with each said insert having an upper surface (34) concentric to said trunnion (1*a*, 2*a*) and supporting a said trunnion along the axial length of said upper surface (34), and each said insert having a downwardly facing bearing surface which is convex in a vertical plane through said central axis (X—X) and rockably engages said base (31, 31*a*) for rocking movement in said vertical plane about a pivot point (80) intermediate the axial ends of each said insert (33) when a level of material in said shell (3) deflects said shell, head plates and trunnions in said vertical plane; and

(c) a proximity probe (50, 75 or 90) rigidly connected to a selected one of said components which is at all times stationary (i.e., 31, 35 or 73) and with said proximity probe adjacently spaced from and aimed at a target portion of a selected one of said components which deflects in response to a change in the level of material within said mill shell (i.e., 60–33, 92 or 70), with said proximity probe operable to monitor the size of a gap between said proximity probe and said target portion and generate a control signal when a change in gap size occurs and thereby indicate a deviation of the level of material within said mill shell from a predetermined and selected material level.

4,648,562
MAGNETIC TAPE WINDING APPARATUS

Seiji Kiuchi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 21, 1985, Ser. No. 736,586
Claims priority, application Japan, May 21, 1984, 59-100396
Int. Cl.[4] B65H *19/26*
U.S. Cl. 242—56 A **9 Claims**



1. A magnetic tape winding apparatus which comprises:

a turntable;

first and second winding shafts and first and second movable tape receiving stands mounted on said turntable, said first winding shaft and said first movable tape receiving stand being arranged symmetrically on opposite ends of said turntable with respect to said second winding shaft and said second movable tape receiving stand, said turntable being rotatably mounted so that positions of said first and second winding shafts and said first and second movable tape receiving stands can be exchanged by turning said turntable through 180°; reel moving means having a reel mounting shaft, and means for moving said reel mounting shaft along a predetermined path, a stationary tape receiving stand being located adjacent one of said first and second movable tape receiving stands as determined by a rotary position of said turntable said reel moving means and said one of said first and second movable tape receiving stands and its associated one of said first and second winding shafts constituting an arranging means;

a second stationary tape receiving stand located adjacent the other of said first and second winding shafts and movable tape receiving stands, each tape receiving stand having

means for holding a tape on a surface thereof, said second stationary tape receiving stand and said other of said first and second winding shafts and movable tape receiving stands constituting magnetic tape winding means; and

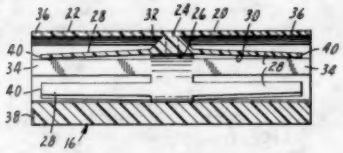
tape cutting means and tape joining means provided for each of said arranging means and said magnetic tape winding means.

4,648,563

LEAF-SPRING ROLLER GUIDE

Dale T. Tollefson, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 10, 1985, Ser. No. 690,467
Int. Cl.[4] B65H *27/00*; G11B *23/087*
U.S. Cl. 242—76 **16 Claims**



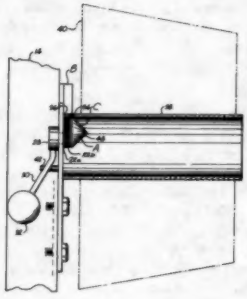
1. One-piece plastic roller guide comprising a tubular body having a substantially cylindrical outer surface, said body including a root from which at least one leaf spring projects in an axial direction such that the inner diameter of the roller guide at the free end of the leaf spring is smaller than its inner diameter at the root, said body being formed in the vicinity of the at least one leaf spring with a plurality of lands wherein each of the lands extends adjacent the at least one leaf spring to an inner diameter approximating that of the root, webs interconnecting the lands and with which the lands and root form the substantially cylindrical outer surface of the tubular body.

4,648,564

QUICK RELEASE YARN PACKAGE HOLDER

Joe Wright, Jr., P.O. Box 6763, Greenville, S.C. 29606

Filed May 16, 1985, Ser. No. 734,552
Int. Cl.[4] B65H *49/10*; D03J *5/16*; F16D *1/00*
U.S. Cl. 242—130 **20 Claims**



1. A yarn package holder device for securely holding a yarn package wound upon a tube comprising:

a bracket plate adapted to be mounted to an associated support structure;

a clamping surface carried adjacent one end of said bracket;

an eccentrically mounted cam rotatably carried on said bracket plate;

actuator means for rotating said cam on said bracket plate; and

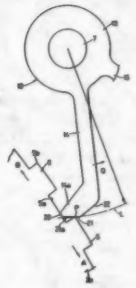
a cam surface carried by said cam movable on an eccentric path from a lower release position to an upper most lock position in which said cam surface firmly clamps said tube of said yarn package between said cam surface and said clamping surface whereby said yarn package is firmly held by said bracket plate.

4,648,565

TAPE CARTRIDGE

Yoshimi Maehara, Kyoto, Japan, assignor to Hitachi Maxell, Ltd., Osaka, Japan

Filed Mar. 19, 1985, Ser. No. 713,608
Claims priority, application Japan, Mar. 19, 1984, 59-52945
Int. Cl.[4] G11B *15/22*, *23/087*
U.S. Cl. 242—198 **2 Claims**



1. A braking mechanism for a tape cartridge comprising:

at least one tape reel provided with a flange having a plurality of engaging teeth consecutively formed on a peripheral edge of said flange, each tooth having at least one corner and being separated from an adjacent tooth by a recess portion, and

a rotatable brake arm provided with a hook shaped engaging end having a nose end face and a slanted engaging wall formed on outside faces of said engaging end of said brake arm, such that during braking of said at least one tape reel, said nose end face is kept in contact with a bottom of at least one of said recess portions between respective teeth, and said engaging wall comes into contact with a corner of one of said teeth at a point P such that a portion of said slanted engaging wall between said point P and said nose end face exists on or is inside of a locus circumscribed by the rotation of said point P about an axis of said brake arm.

4,648,566

SELECTABLE POSITIVE OR FRICTION DRIVE FOR A FISHING REEL

Yoshiyuki Furomoto, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jul. 8, 1985, Ser. No. 752,812
Claims priority, application Japan, Jul. 11, 1984, 59-145005
Int. Cl.[4] A01K *89/02*
U.S. Cl. 242—213 **10 Claims**

1. A fishing reel, comprising:

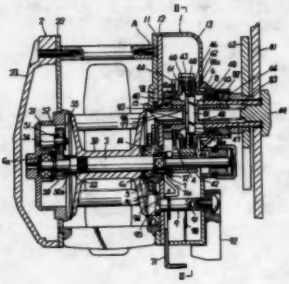
a reel body with a pair of side frames,

a spool mounted on a spool shaft disposed between said side frames,

a driving mechanism including a drive shaft rotatably mounted relative to said side frames, a handle mounted on one end of said drive shaft, a pinion supported on said spool shaft to rotate and slide axially relative thereto, and a main gear rotatably mounted relative to said drive shaft and engageable with said pinion,

a drag mechanism comprising first transmission means, responsive to a driving force from said drive shaft, for transmitting an adjustable transmission force to said main gear,

a second transmission means mounted on said drive shaft and selectively engageable with said main gear to transmit said



driving force from said drive shaft directly to said main gear independently of said first transmission means, and

an operating mechanism for engaging said second transmission means with said main gear, said operating mechanism being mounted on said reel body.

4,648,567

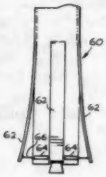
DIRECTIONAL CONTROL OF ROCKETS USING ELASTIC DEFORMATION OF STRUCTURAL MEMBERS

Inge Mandal, Claremont, and John F. Moss, El Toro, both of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Continuation of Ser. No. 477,085, Apr. 28, 1983, abandoned, which is a continuation of Ser. No. 279,891, Jul. 2, 1981, abandoned, which is a division of Ser. No. 104,496, Dec. 17, 1979, abandoned. This application Jul. 26, 1984, Ser. No. 634,620

Int. Cl.[4] F42B *15/02*

U.S. Cl. 244—3.24 **8 Claims**



1. A controllable missile comprising:

a cylindrical missile body including an external skin, having an outer surface encasing the missile;

main propulsion means acting along the axis of the body to propel the missile;

directional control means including a continuously elastically deformable, relatively planar structural member unitarily formed as part of said skin, thereby constituting a portion of said external skin, said member having forward and aft end portions and being separated from adjacent portions of the external skin except at the forward end thereof, whereby said member constitutes a continuous extension of the external skin at said forward end;

adjusting means coupled between said body and said structural member adjacent said aft end for selectively deforming said member substantially throughout its extent between said forward and aft ends to control the direction of said missile in flight; and

means for selectively activating said adjusting means in accordance with applied signals including signals indicating missile attitude.

2. A controllable missile comprising:

a cylindrical missile body including an external skin having an outer surface;

main propulsion means acting along the axis of the body to propel the missile;

directional control means including a continuously elastically deformable, relatively planar structural member unitarily formed as part of said skin, said member having forward and aft end portions and being formed as a continuation of said skin at said forward end; said member having a continuous, uninterrupted structure throughout its extent between said forward and aft ends; said member being continuously deformable elastically along said continuous, uninterrupted structure between the forward and aft ends; and

means for selectively and adjustably deforming said relatively planar structural member in accordance with applied control signals to change the attitude of the missile in flight.

4,648,568

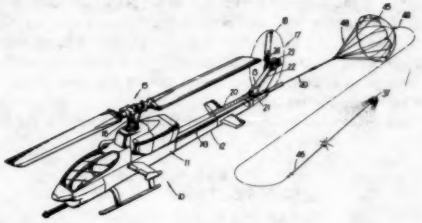
EMERGENCY ANTI-TORQUE CONTROL SYSTEM AND METHOD FOR HELICOPTERS

Richard G. Phillips, 3598-5 Club House Cir. E., Decatur, Ga. 30032

Filed May 28, 1985, Ser. No. 738,409

Int. Cl.[4] B64C *27/82*

U.S. Cl. 244—17.19 **10 Claims**



4. An emergency anti-torque control system for a helicopter comprising a drogue chute adapted to be mounted to a rear end portion of the helicopter, means for monitoring tail rotor performance, and means for deploying said drogue chute in response to said monitoring means detecting the tail rotor to be malfunctioning.

4,648,569

AIRPLANE AUTOMATIC CONTROL FORCE TRIMMING DEVICE FOR ASYMMETRIC ENGINE FAILURES

Eric C. Stewart, Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 23, 1985, Ser. No. 790,556

Int. Cl.[4] B64C *13/00*

U.S. Cl. 244—76 R **8 Claims**

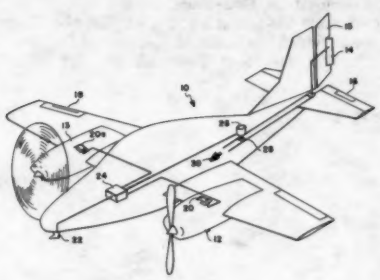
1. A method of improving the controllability of twin-engine propeller-driven airplanes operating in an asymmetric power mode comprising:

measuring the freestream dynamic pressure and the propeller slipstream dynamic pressures;

generating a quantity proportional to the differential thrust coefficient including dividing the difference between said propeller slipstream dynamic pressures by said freestream dynamic pressure; and

adjusting the secondary control surfaces on the airplane in response to the quantity proportional to the differential

thrust coefficient to help reduce the large control force felt in the cockpit due to the asymmetric power condition



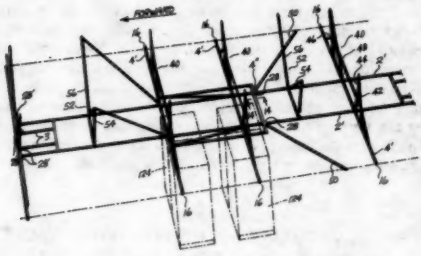
wherein the reduced control forces improve the controllability of the airplane.

4,648,570

METHOD AND APPARATUS FOR SUPPORTING INTERIOR AIRCRAFT ELEMENTS

Michael E. Abdelmaseh, Everett, and Thomas H. Shorey, Freeland Island, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 22, 1984, Ser. No. 644,027
Int. Cl.[4] B64C *1/06, 1/22*
U.S. Cl. 244—118.1 **18 Claims**



1. A method of supporting interior elements of an aircraft within an aircraft fuselage, comprising:

arranging a plurality of longitudinal sections end-to-end along a common longitudinal axis;

connecting each section to any adjacent section with an extension/retraction joint;

nontranslatably connecting one end of a diagonal strut to one of the sections just forward of each such joint, and the other end of said strut to the fuselage aft of said one end; and

allowing said sections to slip axially relative to each other when subjected to axial loads, and allowing said loads to be transferred from said sections to the diagonal struts and to be reacted through the fuselage.

5. Support structure for supporting interior elements of an aircraft within an aircraft fuselage, comprising:

a plurality of longitudinal sections arranged end-to-end along a common longitudinal axis;

an extension/retraction joint connecting each such section and any adjacent section, to allow axial slippage of each such section relative to the other sections;

a plurality of diagonal struts, one corresponding to each such joint; each such strut having a first end nontranslatably connected to one of said sections at a location forward of and closely adjacent to the corresponding joint, and a second end nontranslatably connected to the fuselage at a location aft of the corresponding joint; and

means for reacting vertical and side loads;

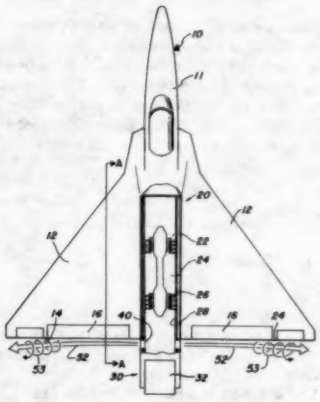
wherein axial loads on said sections cause said sections to slip axially relative to each other, and wherein said axial loads are transferred from said sections to the diagonal struts and are reacted through the fuselage.

4,648,571

TRANSVERSE THRUST LIFT AUGMENTATION SYSTEM

Heinz A. Gerhardt, Redondo Beach, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Jul. 19, 1984, Ser. No. 632,374
Int. Cl.[4] B64C *9/58, 21/04, 23/06*
U.S. Cl. 244—207 **11 Claims**



1. A lift enhancing arrangement for an aircraft having a fuselage, wings extending from the fuselage, and an engine defining a source of propulsive gases which are exhausted generally rearwardly of said aircraft, the improvement comprising:

nozzle means extending through said fuselage immediately behind the trailing edge root of said wings, and opening into the source of exhaust gases of said aircraft; and

means associated with said nozzle means for directing a quantity of exhaust gases through said nozzle means in generally transverse jets along the trailing edge of the wings of said aircraft for entraining the airflow over the wings into said transverse jets to increase air circulation over the wings, to inhibit flow separation, and to thereby increase lift.

4,648,572

BRACKET FOR SUPPORTING A RADAR DETECTOR OR LIKE DEVICE

Steve Sokol, Southfield, Mich., assignor to Detroit Bracket Co., Inc., Ferndale, Mich.

Filed Sep. 17, 1985, Ser. No. 776,793
Int. Cl.[4] F16B *47/00*
U.S. Cl. 248—206.2 **12 Claims**

1. A bracket for supporting a radar detector or like device within a motor vehicle having a windshield, said bracket comprising:

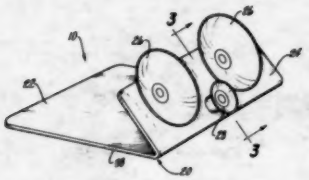
a substantially planar mounting portion;

a substantially planar support portion extending at an acute angle from said mounting portion;

means for detachably securing said bracket to said windshield so that said support portion is oriented in a substantially horizontal position, said securing means comprising

at least two suction cups disposed on said mounting portion to engage said windshield;

means for adjusting the orientation of said bracket with respect to the windshield, said means for adjusting comprising a selectively adjustable spacer disposed between said windshield and said mounting portion at a location



vertically spaced from said at least two suction cups, wherein adjusting said spacer alters the angular relationship between the windshield and the mounting portion, thereby altering the orientation of said bracket to achieve a horizontal orientation of said support portion; and

means for removably mounting said radar detector or like device to the support portion of said bracket.

4,648,573

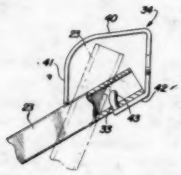
COLLAPSIBLE AWNING SUPPORT FRAME

Oscar R. Rubnerth, 17887 San Clemente St., Fountain Valley, Calif. 92708

Filed Nov. 4, 1985, Ser. No. 794,511

Int. Cl.⁴ A47H *1/10*

U.S. Cl. 248—273 **9 Claims**



1. A collapsible awning support frame comprising;

(a) an elongated rigid thrust member

(b) means for fastening a first end of said thrust member to a building wall,

(c) an elongated rigid tension member,

(d) means for pivotably fastening a first end portion of said tension member to the second end of said thrust member in coplanar alignment therewith, and

(e) a bracket for pivotably fastening the second end of said tension member to a building wall above and in vertical alignment with said means for fastening said first end of said thrust member to said building wall, said bracket having means for fastening said bracket to said wall, and an elongated, curved hook pin fastened to said bracket and protruding upward and outward from a vertical plane, and

(f) an aperture in the bottom surface of said tension member near said second end of said tension member, whereby said aperture may be engaged by said hook pin, thus supporting said tension member against downward loads.

4,648,574

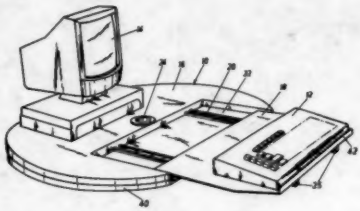
ROTARY STAND

Ingvar Granlund, Eskilstuna, Sweden, assignor to Axhamre International AB, Gothenburg, Sweden

Continuation-in-part of Ser. No. 673,906, Nov. 21, 1984, abandoned, which is a continuation-in-part of Ser. No. 673,907, Nov. 21, 1984, abandoned. This application Nov. 26, 1985, Ser. No. 802,708

Int. Cl.⁴ A47F *5/02*

U.S. Cl. 248—349 **8 Claims**



1. An improved rotary stand for a computer terminal or the like comprising a support disc adapted to support a computer display or its upper face, a thrust bearing provided on the lower face of said support disc, said thrust bearing consisting of two relatively rotatable sections one of which rests in substantially direct contact with a base, such as a table, said rotary stand being configured to serve as a working table to support the computer comprising a display and a keyboard, the improvement comprising said support disc provided with a leaf for support of the computer keyboard, said leaf slidably supported by said support disc to be pulled outwards from the support disc into a keyboard utilizing position, in which position said leaf having supporting means to abut against the base upon which said support disc is positioned and prevent rotation of said support disc, said leaf being arranged to be displaced from the pulled-out keyboard utilizing position inwards over the support disc wherein said supporting means is out of contact with the base to facilitate rotation of the rotary stand and setting thereof in a different angular position.

4,648,575

HEIGHT ADJUSTING DEVICE FOR VEHICLE SEAT

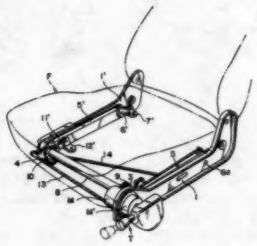
Tateo Kawade, Toda, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed Jul. 11, 1985, Ser. No. 753,827

Claims priority, application Japan, Jul. 16, 1984, 59-145989

Int. Cl.⁴ F16M *13/00*

U.S. Cl. 248—371 **8 Claims**



1. A device for adjusting the height of a seat which is mounted in a vehicle, comprising:

first and second seat front part support means operated by a lifter adjustment input member for selectively moving a

front part of the seat upwardly and downwardly relative to seat bracket bases which are supported by a body of the vehicle;

first and second rear part support means operated by a height adjustment input member for selectively moving a rear part of the seat upwardly and downwardly relative to the seat bracket bases;

said lifter adjustment input member and said height adjustment input member being rotatably supported by said seat bracket bases on a same axis;

seat lock means for locking respectively the seat front part support means and the seat rear part support means in position;

clutch means interposed between the lifter adjustment input member and the height adjustment input member for selectively coupling to allow the lifter adjustment input member and the height adjustment input member to rotate integrally with each other and uncoupling to allow the lifter adjustment input member and the height adjustment input member to rotate relative to each other; and

a control member associated with the lifter adjustment input member to be manipulated to rotate the lifter adjustment input member and couple and uncouple the clutch means,

wherein the first seat front part support means and the first seat rear part support means comprises first support arms which respectively are rotatably supported by the seat bracket bases and link mechansims which respectively are connected at one end rotatably to free ends of said first support arms and at the other end rotatably to the seat, the second seat front part support means and the second seat rear part support means comprising second support arms which respectively are rotatably supported by the seat bracket bases and rotatably connected at free ends to the seat.

4,648,576

MOUNTING STRUCTURE FOR POWER UNIT

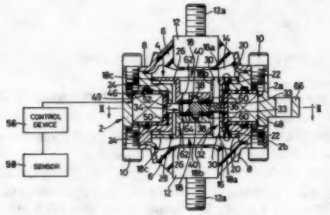
Tetsu Matsui, Kasugai, Japan, assignor to Tokai Rubber Industries, Ltd., Aichi, Japan

Filed Dec. 2, 1985, Ser. No. 803,296

Claims priority, application Japan, Dec. 5, 1984, 59-257128

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—550 **9 Claims**



1. A mounting structure disposed between a body and a power unit of a vehicle for mounting of the power unit on the body, including (a) partition means, (b) a first and a second elastic member which cooperate with said partition means to define at least partially a first and a second fluid chamber on opposite sides of said partition means, respectively, said first and second fluid chambers being filled with an incompressible fluid and having volumes which are variable due to elastic deformation of said elastic members, respectively, and (c) means for defining an orifice which communicates with said first and second fluid chambers to permit a restricted flow of the fluid therebetween, said orifice providing a predetermined resistance to flow of the fluid therethrough, the elastic deformation of said elastic members and the flow resistance of said orifice enabling the mounting structure to damp or absorb vibrations applied thereto, said mounting structure comprising:

by-pass means for defining at least one by-pass passage formed through said partition means to permit fluid communication between said first and second fluid chambers;

a rotary valve member disposed within said partition means and made of a magnetic material, said valve member being rotatable about its axis through a predetermined angle between its closed position in which said at least one by-pass passage is closed by the rotary valve member, and its open position in which said at least one by-pass passage is open; and

a rotary actuator, responsive to an external signal, for operating said rotary valve member between said closed and open position, said rotary actuator comprising a biasing spring for biasing said rotary valve member toward one of said closed and open position, and an annular solenoid coil disposed around and coaxially with said rotary valve member, said solenoid coil being energized in response to said external signal, to rotate said rotary valve member to the other of said closed and open positions against a biasing force of said biasing spring.

4,648,577

VISCOUS DAMPER HAVING A CONICAL PLUNGER TUBE

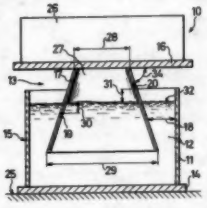
Frank-Michael Weber, Berlin, Fed. Rep. of Germany, assignor to GERB Gesellschaft fur Isolierung mbH & Co., KG, Berlin, Fed. Rep. of Germany

Filed Jun. 27, 1985, Ser. No. 749,410

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1984, 3424338

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—562 **9 Claims**



1. A vibration damper for an object that is to be mounted so as to be elastically yielding comprising:

a damper housing containing a viscous damper medium;

a damper plunger having a top plate for the reception of the object and a plunger tube positionable for moving into and out of said damper housing and said viscous damper medium, wherein said plunger tube defines as downwardly open, hollow and continuously conical frustrum, a small diameter end of said frustrum facing said top plate and a large diameter end of said frustrum extending into said damper housing, and

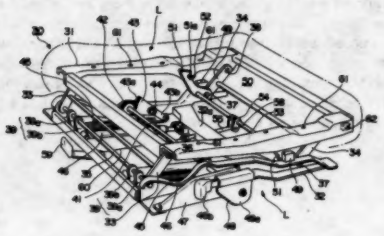
a plurality of small diameter circulation bores extending through the conical surface of said continuously conical frustrum, whereby said viscous damper medium is throttled by circulation through said bores.

4,648,578

WEIGHT ADJUSTMENT DEVICE FOR A SEAT SUSPENSION

Takao Sakamoto, Kishima, Japan, assignor to Tachikawa Spring Co., Ltd., Tokyo, Japan

Filed Sep. 9, 1985, Ser. No. 773,886
Claims priority, application Japan, Sep. 28, 1984, 59-147169[U]
Int. Cl.[4] F16M 13/00
U.S. Cl. 248—576 4 Claims



1. A weight adjustment device for a seat suspension comprising:

a lower frame mounted on a floor side of a vehicle, said lower frame including first and second lateral bar sections;

an upper frame mounted on a seat side of said vehicle so as to be vertically movable relative to said lower frame;

a pair of front links, each being pivotally coupled at one end portion thereof to a forward portion of said upper frame;

a pair of rear links, each being pivotally coupled at one end portion thereof to a rear portion of said upper frame and being pivotally coupled at the other end portion thereof to a rear portion of said lower frame;

a rotary shaft journalled between said first and second lateral bar sections of said lower frame, each end of said rotary shaft having a pinion gear fixedly coupled thereto;

a pair of sector gears, each being pivotally coupled to one of said first and second lateral bar sections, respectively, so as to be vertically rotatable, each of said sector gears including a gear surface and being fixedly coupled to one end of a projection piece, each said projection piece extending from said sector gear in a direction opposite to a facing direction of each said gear surface, each said sector gear being engaged with one of said pinion gears, respectively, at said gear surface;

an operation lever fixedly coupled to said rotary shaft;

a rod rotatably journalled between said first and second lateral bar sections of said lower frame, each of said front links being fixedly coupled at the other end portion thereof to each end portion of said rod, respectively;

first and second arms, each arm including at least one arm member, each of said arms being fixedly coupled at one end thereof to said rod, adjacent to each of said front links, respectively, the other end of each of said arms extending downwardly relative to said rod; and

a pair of tension springs, each being extended between one of said other ends of said arms and one of said projection pieces, respectively, so as to bias said upper frmae upwardly relative to said lower frame,

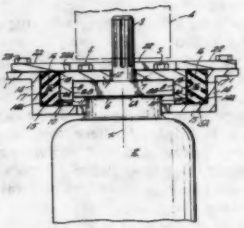
whereby operation of said operation lever causes rotation of said rotary shaft and simultaneous rotation of said pinion gears, thereby rotating said sector gears and thus varying the tensile forces of said tension springs so as to adjust the height of said upper frame relative to said lower frame.

4,648,579

CUSHIONED MOUNTING ARRANGEMENT FOR A MOTOR HOUSING

John D. Wilson, 79189 Terretorial Hwy., Lorane, Oreg. 97451

Filed Jun. 10, 1985, Ser. No. 742,941
Int. Cl.[4] F16M 3/00
U.S. Cl. 248—638 3 Claims



1. In combination a motor mount and a motor housing, said motor mount providing for the cushioning of a motor housing and face plate thereon against operational loads in reaction to output shaft torque, said motor housing receiving a motor output shaft, said mount comprising,

wall structure having perpendicularly oriented walls defining a motor mount area concentric with the motor output shaft,

bracket means for attachment about one end of the motor housing and having wall surfaces in said motor mount area and inwardly offset from and parallel to certain of said perpendicularly oriented walls, said bracket means in movable rested engagement with said wall structure and including a wear ring, and

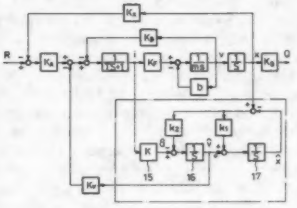
cushioning means including elongate resilient members located in said area between said bracket means and said certain perpendicularly oriented walls which members may compress upon arcuate displacement of said bracket means in response to output shaft loads to cushion the motor housing against reaction to motor output shaft loads.

4,648,580

DIRECT-DRIVE TYPE ELECTRO-HYDRAULIC SERVO VALVE

Hiroaki Kuwano, Yokohama; Toshiro Matsushita, Yokosuka; Hideaki Kakuma, Atsugi, and Teruaki Motomiya, Sagamihara, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 601,593, Apr. 18, 1984, abandoned.
This application Mar. 20, 1986, Ser. No. 842,079
Claims priority, application Japan, Apr. 19, 1983, 58-68997
Int. Cl.[4] F15B 13/044
U.S. Cl. 251—129.01 4 Claims



1. A direct drive electro-hydraulic servo valve comprising a valve body accommodating a spool, a coil mechanically con-

nected to the spool and electrically connected to a servo amplifier and a permanent magnet mounted on the valve body, said spool being directly driven by energization of the coil by the amplifier, the valve also including simulating means located outside of the valve body for simulating characteristics of the spool connected to the amplifier, said simulating means being arranged to functionally relate a signal representative of spool position with a signal representative of current input to the coil to derive a signal representative of spool velocity which is thereby generated entirely within said simulating device and is then negatively fed back to the amplifier.

4,648,581

COUPLING HEAD FOR PRESSURE MEDIUM LINES OF PRESSURE MEDIUM BRAKE UNITS IN VEHICLES

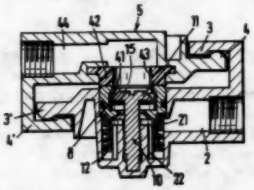
Dietrich Neumann, Schulstrasse 41, 6923 Walbstadt, Fed. Rep. of Germany

Filed Jul. 5, 1985, Ser. No. 752,376

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1984, 3425113

Int. Cl.[4] F16L *29/00*

U.S. Cl. 251—149.6 **12 Claims**



11. A coupling head for pressure medium lines of pressure medium brake units in vehicles, said coupling head including: a main body having at least one supply inlet, and at least one outlet opening, for said pressure medium; a valve body fixedly disposed in said main body; a sealing element of elastic material which is fixedly disposed in a mounting space, with at least a portion of the periphery of said sealing element being braced against transverse deformation, said sealing element furthermore being able to block off access of said supply inlet to said outlet opening; and an actuating member which, when said coupling head is connected to a cooperating coupling head, is displaceable against spring force for opening the passage from said supply inlet to said outlet opening for said pressure medium, on said valve body there being provided an abutment against which at least one counter abutment of said actuating member rests under force; the improvement wherein:

said main body is provided with a guide part for said actuating member which has a threaded bore;

said valve body being formed by a screw which is screwed into said threaded bore of said guide part;

said valve screw having a head which includes said abutment for said actuating member, with the latter surrounding, and being spaced from, said valve screw;

said mounting space being provided on one of said abutment and said actuating member, with the thickness of said sealing element being greater than the depth of said mounting space; and

at least one flow-through channel being provided between said guide part and said actuating member; in the open position of said actuating member, said flow-through channel connecting said supply inlet with said outlet opening; said counter abutment of said actuating member being in the form of a circumferentially extending, radially inwardly directed flange; said main body having a base from which said guide part extends toward said counter abutment flange of said actuating member; said actuating member comprising two parts, namely a first part and a second part, which are securely interconnected; said first part including a sleeve-like end section, with said second part being seated on, and partially overlapping, said sleeve-like end section of said first part; said first part of said actuating member having a further section, and a radially outwardly directed flange, with said further section extending from one side of said flange in a first direction, and with said sleeve-like end section extending from the other side of said flange in the opposite direction.

4,648,582

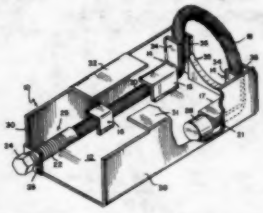
PORTABLE CLAMPING DEVICE FOR A WHEEL JACK

John C. Grundahl, and Bryce K. Grundahl, both of Route 1, Box 149A, Dassel, Minn. 55325

Filed Jun. 6, 1985, Ser. No. 742,110

Int. Cl.[4] B66F *3/00*

U.S. Cl. 254—133 R **22 Claims**



1. A clamping device for supporting a lifting device for lifting a vehicle wheel, said device being reversibly engageable with a vehicle axle, comprising:

longitudinally extending base means,

first guide means extending transversely from said base means for defining a transverse plane,

second guide means on said base means for defining a longitudinal path, said path extending in a direction away from said transverse plane,

cable means for engaging said first and second guide means, said cable means having an arcuate segment with first and second end regions extending along said transverse plane, and at least one linear segment extending from said first end region of said arcuate segment along said longitudinal path,

cable end securing means for securing said second end region of said arcuate segment to said base means, and

cable retracting means on said base means for reversibly retracting said at least one linear segment of said cable away from said first guide means, said retracting means being capable of causing said arcuate segment to engage a surface of said axle positioned between said base and said arcuate segment in response to said retracting, and

lifting device supporting means on said base means for supporting said lifting device.

4,648,583

WHEEL LIFTING KIT FOR BUMPER JACKS

William G. Greene, 28 Scott Rd., West Brome, Quebec J0E 2P0, Canada

Continuation of Ser. No. 582,090, Feb. 21, 1984, abandoned. This application Jun. 28, 1985, Ser. No. 750,230

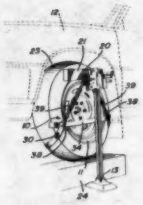
Claims priority, application Canada, Nov. 4, 1983, 440498

Int. Cl.[4] B66F *3/00*

U.S. Cl. 254—133 R **1 Claim**

1. A rigid closed-loop metal-strap bracket adapted to be suspended from two hook means depending from two flexible link lift members, said lift members extending upwards to a single lifting connector for lifting a vehicle by a wheel-and-inflated-tire portion thereof using external lifting means, said closed-loop bracket comprising two rigid metal-strap elements, a first strap element having an elongate central portion substan-

tially horizontal adapted to straddle strap-like between inboard-most surfaces of a wheel-and-inflated-tire portion of a vehicle, at a distance substantially the radius of said wheel, below the rotation axis of said wheel and tire, said first element adapted symmetrically from said horizontal elongate portion towards the extremeties of said first element to curve upwards strap-like against said tire towards and to outboard surfaces thereof, whence extremeties of said first element project in symmetrically convergent directions substantially towards a point on the outboard-most surface of said tire, said point vertically above the rotation axis of said wheel and tire, and said extremeties terminating at an upper edge of, and outboard of, and overlapping a second strap element; said second strap element substantially horizontal adjacent below the rotation axis of said wheel and tire, adapted to straddle strap-like between the outboard-most surfaces of said tire, and thence the extremeties of said second element, adapted symmetrically strap-like against curving surfaces of said tire, overlapped by extremeties of said first element, and the extremeties of said second element terminating short of projecting horizontally



beyond the periphery of said tire; two holes through each of said strap elements, said holes being two pairs of co-axial holes substantially at center portions of the overlapping areas of said two strap elements; two flexible link members with depending hook means, connecting through said two pairs of co-axial holes, thereby connecting said two strap elements to form a closed metal loop embracing said wheel and tire, and said link members extending upwards converging to a single lifting connector and pivotally connect thereto by single bolt means through links at or adjacent the extremeties of said link members on respective sides of said connector generally vertically above the rotation axis of said wheel and tire and adjacent the outboard-most surface of said tire, and said lifting connector adapted in its central portion for interfitting engagement with a lifting-force member of an external lifting device; and spacer block means to separate said lifting connector from said tire if necessary to provide clearance between portions of said vehicle and portions of said external lifting device, and if necessary to provide vertical alignment of an external lifting device such as a bumper jack.

4,648,584

HOODED METALLURGICAL VESSEL

Karl Wamser, Moers, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jul. 19, 1985, Ser. No. 756,602

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1984, 3427086

Int. Cl.[4] C21C *5/38*

U.S. Cl. 266—158 **7 Claims**

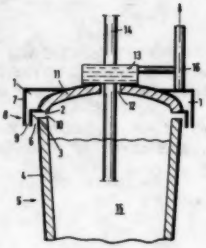
1. A metallurgical vessel comprising:

(a) an upwardly open vessel, said upwardly open vessel having an upper rim;

(b) a downwardly open heat shield having a lower rim, said downwardly open heat shield being sized and shaped so that, in use, its lower rim opposes but is spaced from the upper rim of said upwardly open vessel, leaving a peripheral air gap therebetween;

(c) a continuous partition having a lower rim, said continuous partition being tightly connected to said heat shield and extending downwardly therefrom to a level lower than the upper rim of said upwardly open vessel, said continuous partition being spaced outwardly from the upper rim of said upwardly open vessel so as to leave a continuous inner annular gap between said upwardly open vessel and said continuous partition;

(d) a suction hood having a lower rim, said suction hood surrounding said downwardly open heat shield and said



continuous partition, the lower rim of said suction hood being outwardly spaced from the lower rim of said continuous partition, leaving a continuous external annular gap between said continuous partition and said suction hood which forms an annual intake nozzle which surrounds said upwardly open vessel and the opening of which is lower than the upper rim of said upwardly open vessel; and

(e) at least one opening in said downwardly open heat shield through which, in use, a probe can be inserted from the outside into the interior of said upwardly open vessel.

4,648,585

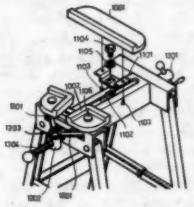
VISE STRUCTURE HAVING ARTICULATABLE VISE JAWS

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Filed Jun. 7, 1985, Ser. No. 742,599

Int. Cl.[4] B25B *1/10*

U.S. Cl. 269—104 **3 Claims**



1. A vise structure comprising a frame having respective first and second end portions longitudinally of the frame, a first vise jaw at the first end portion of the frame and arranged substantially transversely thereof, means for guiding the first vise jaw on the frame for movement longitudinally of the frame in a direction from the first end portion to the second end portion of the frame, a pair of pivotably-mounted second vise jaws spaced apart from one another at the second end portion of the frame, means for guiding the respective second vise jaws towards and away from one another at the second end portion of the frame and in a direction substantially transverse to the longitudinal movement of the first vise jaw, rod means rotatably journaled in the frame, manually-manipulatable handle means associated with the rod means, the rod means

including a threaded inner rod and a threaded outer rod, first nut means carried by the outer rod and connected to the first vise jaw, whereby the first vise jaw moves longitudinally of the frame in response to rotation of the outer rod, second nut means carried by the inner rod, respective linkage means connecting the second nut means to the second vise jaws, whereby the second vise jaws move transversely of the frame in response to rotation of the inner rod, and means associated with the handle means for selectively effecting rotation of either the inner rod, the outer rod, or both the inner and outer rods upon rotation of the handle means.

4,648,586

GEAR FOLDER

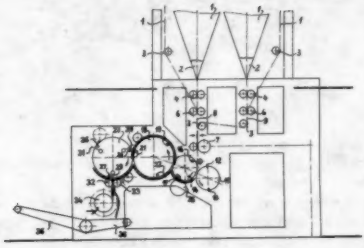
Horst B. Michalik, Höchberg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 18, 1985, Ser. No. 810,141

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1985, 3538799; Dec. 12, 1985, 3543868

Int. Cl.⁴ B42C *1/04*

U.S. Cl. 270—50 **5 Claims**



1. A gear folder for folding paper webs, said gear folder comprising:

a cutting cylinder having at least one cutting knife positioned on a peripheral portion of said cutting cylinder;

a pin-holing and grooved bar cylinder cooperating with said cutting cylinder, said pin-holing and grooved bar cylinder having at least two controllable pin sets;

a collecting cylinder cooperating with said pin-holing and grooved bar cylinder and receiving signatures severed from the paper web by said cutting cylinder and cooperating pin-holing and grooved bar cylinder, said collecting cylinder having at least three controllable pin sets;

a folding blade cylinder cooperating with said collecting cylinder and having at least two controllable sets of grippers and at least two gear folding blades, said folding blade cylinder receiving collected signatures from said collecting cylinder and delivering said signatures to a pair of folding rollers, said folding blades inserting said signatures between said folding rollers.

4,648,587

FLAT ARTICLE FEEDING APPARATUS

Kunio Hiromori, and Masahiko Noguchi, both of Tokyo, Japan, assignors to NEC Corporation, Japan

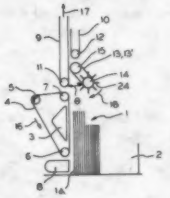
Filed Mar. 26, 1984, Ser. No. 593,479

Claims priority, application Japan, Mar. 24, 1983, 58-49578

Int. Cl.⁴ B65H *5/08*

U.S. Cl. 271—12 **8 Claims**

1. A stacker-loader for converting a stack of parallel flat articles into a sequential series of said flat articles, said stacker-loader comprising means for accumulating a stack of said flat articles in a standing parallel position, suction belt means with a flat section confronting said stack of flat articles, said suction belt means forming a vacuum pick up means for sequentially moving the flat articles, one by one, from said stack and into a transport path, a confronting pair of running belts positioned to receive said flat articles as said suction belt means move them into said transport path, and intake means at the junction of said suction belt means and said confronting pair of running belts, said intake means comprising a belt set at an angle of θ



with respect to said transport path for guiding and directing said flat articles as they enter said transport path, the speed V_1 of said intake belt and the speed V_2 of said confronting belts having a relationship of $V_1=(V_2/\cos\theta)$.

4,648,588

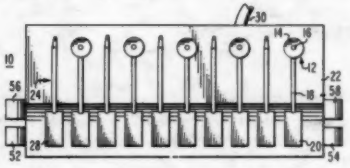
ARTICLE MANIPULATION DEVICE

Ross M. Carrell, Burlington, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 12, 1985, Ser. No. 743,827

Int. Cl.⁴ B65H *3/08*

U.S. Cl. 271—91 **12 Claims**



1. An articulated manipulation device comprising in combination:

a base member having a plurality of spaced apart orifices;

a plurality of vacuum fingers, each comprising an elongated arm, one end of each arm having an orifice open to the atmosphere, the other end of each arm being individually pivotably coupled to said base member, each arm having a passageway extending from said orifice to said other end;

means providing an airtight connection between said passageway at said other end and an associated orifice in said base member; and

means coupled to said base member for creating reduced pressure relative to atmospheric pressure at selected ones of said orifices.

4,648,589

METHOD AND APPARATUS FOR ALIGNING AND FEEDING SHEETS FOR PRINTING PRESSES

Helmut Emrich, Offenbach am Main, and Jurgen Wenzel, Hainburg, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 18, 1985, Ser. No. 788,888

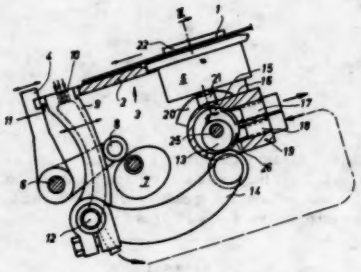
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1984, 3438134

Int. Cl.⁴ B65H *9/00*

U.S. Cl. 271—236 **9 Claims**

1. A method of aligning and feeding sheets for a printing

press having conveying means for supplying the sheets individually from a feed stack to the front and side lays in a feed table of the press, said feed table having vacuum means including suction arms disposed below the sheets and ahead of the front lays with respect to the direction of sheet movement and being reciprocable relative to said direction by first cam means, the side lays being movable transversely to said direction of sheet movement by second cam means, and a suction disc for controlling the negative pressure applied to the suction arms, said



first and second cam means and said suction disc being secured to a single shaft and adjustably laid out in angular relation to one another, said method comprising the steps of: causing the sheets to first strike the front lays, then drawing the sheets against a side abutment by the transverse movement of the side lays, and characterized in that after the side-drawing step the sheets are engaged from below by said vacuum means and are again pressed against the front lays by reciprocating said vacuum means.

4,648,590

TRANSPORT DEVICE FOR PAPER SHEETS

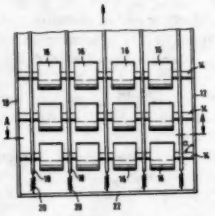
Klaus Paulat, Schoneburg Schwendi, Fed. Rep. of Germany, assignor to Helmut Steinhilber, Rottweil, Fed. Rep. of Germany

Filed Apr. 4, 1984, Ser. No. 596,529

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1983, 3313046

Int. Cl.[4] B65H *5/06*

U.S. Cl. 271—272 **4 Claims**



1. In a transport device for feeding paper sheets along a predetermined path, the combination of: supporting means; a plurality of axially stationary, rotatably driven shafts mounted in parallelism on said supporting means; a plurality of driven rollers affixed to each of said shafts in spaced relationship for frictionally engaging and transporting said paper sheets along said path, said path being along a plane tangential to the surfaces of said rollers and the spaces between said rollers on said plurality of shafts being aligned; and a plurality of elongated, flexible filaments mounted, under tension, on said supporting means and extending parallel to the transport direction of said sheets and having smooth surfaces, said filaments being aligned with the spaces between said rollers and located within said predetermined path for resiliently urging said paper sheets against said rollers.

4,648,591

APPARATUS FOR POCKETING DOCUMENTS IN VERTICALLY ALIGNED POCKETS

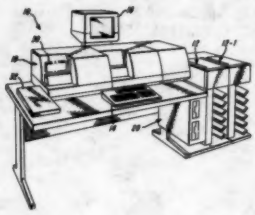
Miroslav S. Osmera, Waterloo; Anton Bella; Fredrik L. N. Kallin, both of Kitchener, all of Canada, and Edward R. Evans, Annapolis, Md., assignors to NCR Corporation, Dayton, Ohio

Filed Jun. 17, 1985, Ser. No. 745,544

Claims priority, application United Kingdom, Sep. 13, 1984, 8423151

Int. Cl.[4] B65H *5/02*

U.S. Cl. 271—305 **17 Claims**



1. A pocketing apparatus comprising:

a plurality of pocket members for selectively receiving documents to be pocketed;

a transfer station to receive said documents to be pocketed;

a first means and a second means positioned at said transfer station to receive said documents therebetween;

first moving means for moving a said document to be pocketed in a first direction in a plane to said transfer station;

second moving means for moving said document in a second direction in said plane from said transfer station to said plurality of pocket members; and

means for mounting one of said first and second means for reciprocal movement parallel to said plane and along said first direction to facilitate removing a said document which may become jammed at said transfer station;

said first and second directions being substantially perpendicular to each other.

4,648,592

GYMNASTIC FLOOR STRUCTURE HAVING VERTICAL ELASTICITY

Atsushi Harinishi, 976 Uemachi, Izumisano-shi, Osaka, Japan

Filed Jun. 25, 1985, Ser. No. 748,688

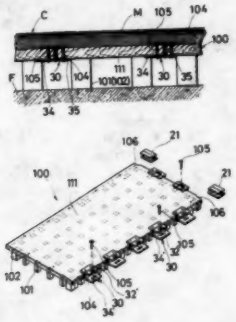
Claims priority, application Japan, Jun. 28, 1984, 59-97884[U]; Jun. 30, 1984, 59-136345

Int. Cl.[4] A63J *3/00;* **E04B** *5/43*

U.S. Cl. 272—3 **3 Claims**

1. A gymnastic floor structure comprising a panel board assembly composed of a plurality of rectangular unit panel boards closely connected with one another on a flat plane and connected by connecting means, lower floor members composed of a plurality of elastic support members which are spacedly secured to the bottom of said panel board assembly and placed on a gymnasium base floor to elastically repulse external forces such as jump forces applied onto said panel board assembly, an upper floor member placed directly on and in contact with substantially all of an upper surface of said panel board assembly to elastically support the external forces, said upper floor member comprising an elastic mat and a carpet placed on said mat, and said elastic mat is made of ethylene vinyl acetate resin foam modified by ethylene propylene rubber and butadiene rubber and functioning in cooperation with

said carpet to elastically support external forces applied onto said carpet, and tightening means which prevent said unit panel board assembly from loosening in the connecting directions, wherein said elastic support members are made of ethylene vinyl acetate resin foam modified by ethylene propylene rubber and butadiene rubber having a multiplying factor of 5 to 6, said connecting means have an almost l-shaped cross section



composed of two U-shaped channels integrated back to back, one channel of said connecting means is used as a fixing part and the other channel is used as a fitting part, between two adjacent unit panels, said fixing part of said connecting means is to fit to the side edge portion of one unit panel board and secured with fastening means, and said fitting part is fitted to the side edge portion of the other unit panel board.

4,648,593

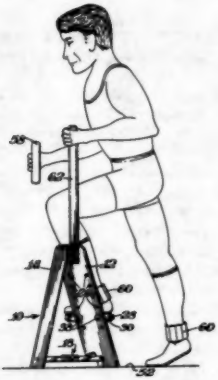
DEVICE FOR SIMULATION OF CLIMBING

William T. Wilkinson, Morris Farm, Rte. 841, Kemblesville, Pa. 19347

Continuation-in-part of Ser. No. 628,045, Jul. 5, 1984, abandoned, which is a continuation-in-part of Ser. No. 541,879, Oct. 14, 1983, abandoned, which is a continuation-in-part of Ser. No. 388,881, Jun. 16, 1982, Pat. No. 4,561,652, which is a continuation-in-part of Ser. No. 235,419, Feb. 17, 1981, Pat. No. 4,340,218. This application Oct. 4, 1985, Ser. No. 784,536

Int. Cl.[4] A63B *23/04*

U.S. Cl. 272—70 **21 Claims**



1. An adjustable stepping device comprising a frame consisting of a pair of side support units, each of said units comprising a front leg and a back leg, pivot means pivotally connecting said legs at their upper ends with respect to each other, brace means interconnecting front and back legs at a location remote from their pivotal connection to maintain said front and back legs at a fixed angle with respect to each other, a support member interconnecting said side support units for maintaining said support units a fixed distance from each other, a plurality of vertically spaced mounting elements on each of said front legs, each of said mounting elements on one of said front legs being associated with and coplanar with a corresponding mounting element in the other of said front legs whereby said mounting elements are arranged in vertically spaced sets, a step in the form of a horizontal support platform in contact with and detachably connected to said front legs by being selectively engaged to one of said sets of mounting elements for mounting said step at one of plurality of elevations, said step bridging said support units, said step being the forwardmost horizontal structural element bridging said support units, and said step being the sole support platform of said device, and the sole support platform spanning said front legs whereby a user may select the elevation of said platform and then step thereon, the length of said platform being less than the distance between said front legs, said mounting elements comprising holes extending completely through said front legs, said platform having corresponding holes in its side edges thereof, and fasteners removably extending through a set of said holes in said front legs and into said holes in said platform.

16. An adjustable steppng device comprising a frame consisting of a pair of side support units, each of said units comprising a front leg and a back leg, pivot means pivotally connecting said legs at their upper ends with respect to each other, brace means interconnecting front and back legs at a location remote from their pivotal connection to maintain said front and back legs at a fixed angle with respect to each other, a support member interconnecting said side support units for maintaining said side support units a fixed distance from each other, a plurality of vertically spaced mounting elements on each of said front legs, each of said mounting elements on one of said front legs being associated with and coplanar with a corresponding mounting element in the other of said front legs whereby said mounting elements are arranged in vertically spaced sets, a step in the form of a horizontal support platform in contact with an detachably connected to said front legs by being selectively engaged to one of said sets of mounting elements for mounting said step at one of a plurality of elevations, said step bridging said support units, said step being the forwardmost horizontal structural element bridging said support units, and said step being the sole support platform of said device, and the sole support platform spanning said front legs whereby a user may select the elevation of said platform and then step thereon said support member comprises a rod spanning said back legs and connected thereto, said front legs having notches for accommodating said rod when said device is in its collapsed condition said back legs being spaced a greater distance apart than the distance between said front legs, said front legs being between said back legs when said device is in its collapsed condition, said front legs being wider than said back legs, and said back legs being conformed within the periphery of said front legs when said device is in its collapsed condition.

4,648,594

BODY TRAINING DEVICE

John J. Schleffendorf, 2312 Crescent Ave., Waukegan, Ill. 60085

Filed Jan. 14, 1985, Ser. No. 690,991

Int. Cl.[4] A63B *21/06*

U.S. Cl. 272—118 **9 Claims**

1. A body training device, comprising:

(a) a frame including a horizontal base member, an upper support member, and a horizontal intermediate support member;

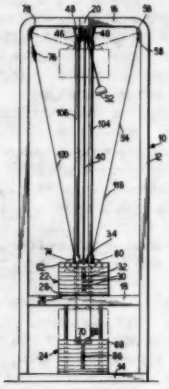
(b) a weight stack comprised of individual weight plates supported at rest on said horizontal intermediate support member;

(c) a first cable having a handle at one end and connected at

the other end to a selectable number of said weight plates, and passing over a first pulley means secured to said upper support member;

(d) a second pulley means rotatably supported on the uppermost one of said weight plates;

(e) a third pulley means disposed functionally directly below said second pulley means;



(f) a second cable extending about said third pulley means and thence vertically upwardly through said weight stack and against said second pulley means on said weight stack and thence upwardly in two angularly diverging portions to said upper support member of said frame; and

(g) means tensioning said second cable.

4,648,595

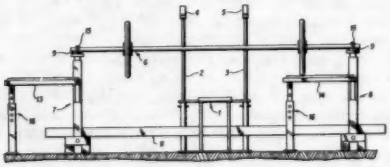
BENCH PRESS SAFETY PLATFORM WITH UNLOADING SHELF

Robert W. Selle, 6157 Pershing Ave., Downers Grove, Ill. 60516

Filed Jun. 14, 1985, Ser. No. 744,541

Int. Cl.[4] A63B *13/00*

U.S. Cl. 272—123 **9 Claims**



1. A bench press safety apparatus for athletes using a barbell with a standard weight lifting bench press, said barbell capable of receiving weight disks thereon, comprising:

left- and right-hand bridge members, said bridge members joined by a connector beam to secure said bridge members at a fixed distance apart and lend stability and rigidity thereto.

said bridge members including upper and lower horizontal support surfaces wherein said lower horizontal support surfaces include respective left- and right-hand unloading means capable of supporting said weight disks and rotating means to allow said lower horizontal support surfaces to be selectively swung inwardly and outwardly of said bridge members serving to locate said lower horizontal support surfaces, in an in use position and storage position, respectively, said upper horizontal support surfaces serving to support the bar ends of a barbell in the event of a failed exercise by a weight lifter using said apparatus, thus precluding injury to said weight lifter by fall and impact of said barbell upon the weight lifter, and

said lower horizontal support members serving to locate said left- and right-hand unloading means, such that said weight lifter, having been protected from injury during a failed exercise by said upper horizontal support surfaces, may then reposition said barbell from said upper support surfaces to said left- and right-hand unloading means to facilitate unweighting of the barbell and resumption of the weight lifter's exercise routine.

4,648,596

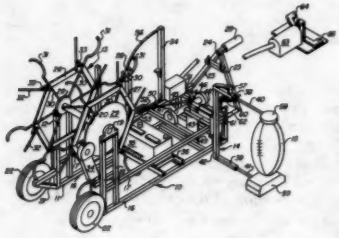
FOOTBALL PLACE KICKING APPARATUS AND METHOD

Donald Long, 519 N. Main Ave., Maiden, N.C. 28658

Filed Sep. 30, 1982, Ser. No. 430,740

Int. Cl.[4] A63B *67/00*

U.S. Cl. 273—55 B **11 Claims**



10. A football place kick positioning apparatus comprising a base frame, a football-supporting holder mounted on said frame, said football-supporting holder having means for releasably supporting at least one football, means for grasping said football at opposite ends thereof and removing it from said holder and displacing said football along a directed path of travel to a position for place kicking while supporting said football in a substantially vertical position at opposite ends thereof by said football grasping means.

4,648,597

BICYCLE SUPPORT DEVICE

Percy Adler, 276 Cedar Avenue, Richmond Hill, Ontario, Canada

Filed Aug. 26, 1985, Ser. No. 769,292

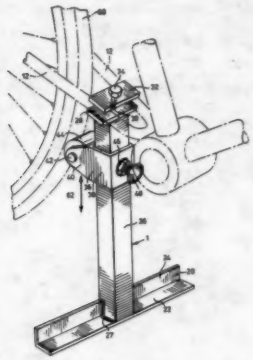
Claims priority, application Canada, Aug. 27, 1984, 461894

Int. Cl.[4] A63B *69/16*

U.S. Cl. 272—73 **21 Claims**

21. A bicycle support device for use with a bicycle having a frame including rear forks extending rearwardly from a crank bracket, the bicycle support device comprising: a base member of sufficient width to provide a stable support for a bicycle; a vertical member extending upwardly from the base member, a first, support bracket secured to the top of the vertical member for supporting the frame at the rear forks between the rear wheel and the crank bracket, with the rear wheel clear of the ground, a clamping member attachable to the first, support bracket for clamping rear forks to the support bracket; a second bracket which is slidably mounted on the vertical member and comprises a body section which encircles the vertical member and has an internal section corresponding to the exterior section of the vertical member, two side arms extending rearwardly from the body section, and a shaft extending between the side arms, with the body section including a threaded bore; a threaded bolt engaging the threaded bore of

the body section for locking the second bracket to the vertical member; and a friction roller rotatably mounted on the shaft of



the second bracket and including a ground, cylindrical surface for engaging the rear wheel of a bicycle.

4,648,598

GOLF CLUB WITH AIR PERMEABLE SHAFT

Sung B. Kim, Rt. 20, Sampson Rd., P.O. Box 220, Charlton, Mass. 01507

Filed Jun. 18, 1985, Ser. No. 746,070
Int. Cl.[4] A63B *53/12, 53/10*
U.S. Cl. 273—80 R **25 Claims**

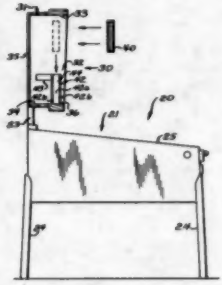
1. A golf club having reduced wind resistence during the swing thereof, said golf club comprising head means for striking a golf ball, a grip and a shaft, the shaft being secured to the grip adjacent one end thereof and being secured to the head means adjacent the opposite end thereof, the shaft comprising a skeletal air permeable frame, the frame including from five to thirty spaced apart rods arranged longitudinally about a longitudinal axis, the longitudinal axis extending from the grip to the head means and means integrally interconnecting the rods for providing unitary coaction of the rods as a single club shaft, the interconnecting means including at least one continuous tie member spanning at least two adjacent rods at a plurality of spaced intersections along the length of each of the two rods and means unitarily joining the tie member to each of the rods.

4,648,599

PINBALL MACHINE WITH MODULAR DISPLAY

Max Wiczer, Skokie, Ill., assignor to Wico Distribution Company, L. P., Niles, Ill.

Filed Apr. 12, 1985, Ser. No. 722,463
Int. Cl.[4] A63F *7/00*
U.S. Cl. 273—121 A **13 Claims**

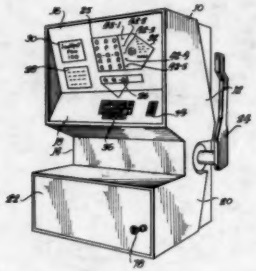


1. In a pinball machine including a lower playfield cabinet and an upper cabinet supported on the lower cabinet, a modular display assembly for providing a display of game information including player score and game status information, said modular display assembly comprising support means, a plurality of display means, interconnect means, and a display panel, said support means including a generally rectangular frame having top and bottom walls and a pair of side walls and having a front surface and a rear surface, said front surface having a plurality of recesses and a plurality of apertures through said support means from said front surface to said rear surface, the center portion of each recess being cut away defining certain ones of said apertures and the peripheral edges of each recess defining a mounting shoulder, each of said display means including a display unit for displaying game information and being located in a different one of said recesses of said support means, said interconnect means being located rearwardly of said support means adjacent to said apertures and including means in cooperative engagement with at least first and second ones of said display means through said apertures securing said display means to said support means, said display panel having clear and opaque areas and being located at said front surface of said support means forward of said display means, enclosing said display means within said support means with its clear areas in registration with said display units, exposing them to view, each of said display means including a display circuit board with its display unit mounted on the forward surface thereof and the peripheral edge of the display circuit board engaging said mounting shoulder, each display circuit board having a pattern of conductors printed on the rearward surface thereof inwardly of the peripheral edge of said board, certain ones of said conductors being connected to the display unit mounted on said display circuit board for extending control signals thereto, and said interconnect means including at least one interconnect circuit board having first and second connection means extending along first and second edges thereof and a pattern of conductors printed on a surface thereof and extending between said first and second edges and connected to said first and second connection means, said first and second connection means engaging conductors on a pair of display circuit boards whereby its conductors interconnect said conductors on said pair of display circuit boards, and a plurality of indicating devices mounted on the forward surface of said interconnect circuit board and located within further ones of said apertures in said frame, said display panel bearing indicia representing game status information and said indicating devices being selectively energizeable to selectively illuminate said indicia.

4,648,600
VIDEO SLOT MACHINE

William E. Olliges, Barrington Hills, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 482,742, Jun. 24, 1974, abandoned. This application Feb. 3, 1976, Ser. No. 654,916
Int. Cl.[4] A63F 9/22
U.S. Cl. 273—138 A 22 Claims



1. An electronic slot machine which comprises a cathode ray tube, means for displaying a plurality of symbols of each of a plurality of sets of symbols on said cathode ray tube, means for selecting at least one combination of winning symbols and producing winning symbols signals corresponding thereto, means for moving the displayed symbols of each set on said cathode ray tube along a respective predetermined path in simulation of the wheels of a mechanical slot machine, said respective paths being parallel to one another, means including randomizing means for stopping the motion of the displayed symbols with a random one of said displayed symbols of each set at a predetermined position along said paths, means for producing displayed symbol signals corresponding to the symbols displayed at said predetermined positions, comparison means for comparing said displayed symbol signals to said winning symbol signals to find matches between the symbols stopped at said predetermined position and respective ones of said selected at least one combination of winning symbols, and reward means responsive to said comparing means for providing a reward when said comparing means finds at least one symbol match.

4,648,601
MULTI-LEVEL BOARD GAME

Tracy J. Carmichael, 17300 Freeland St., Detroit, Mich. 48235

Filed May 1, 1985, Ser. No. 729,417
Int. Cl.[4] A63F 3/00
U.S. Cl. 273—241 4 Claims

1. A board game apparatus for simulating real estate, banking and business situations comprising:

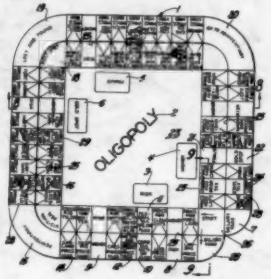
(a) a game board, said game board having a first portion at a first level and a second portion, surrounding said first portion, at a second level, one of said levels being higher than the other, a plurality of contiguous marked spaces defining a path extending around said first portion and defining a continuous closed track adjacent to said second portion of said game board; a second plurality of contiguous marked spaced on said second portion defining a continuous closed track adjacent to and surrounding said path on said first portion of said game board, a single space common to said first and second tracks, said single space comprising a first portion defining a ramp extending from said path on said first level to a first space on said second level and a second portion defining a ramp extending between a second space on said second level to said path on said first level, and means preventing pieces placed on said higher level from falling onto the other level;

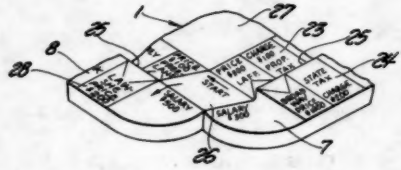
(b) tokens for movement by each player along the paths;

(c) means for determing determining the number of spaces the tokens are to be moved;

(d) means defining subgroups of spaces different from the other subgroups defined thereby;

(e) means for indicating rental fees required for use and occupancy of said spaces;





(f) simulated money for use by the players of the game;

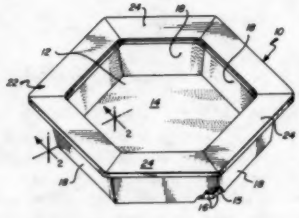
(g) means for keeping records during the game for each player and a banker and;

(h) means simulating buildings for placement on selected spaces for indicating increased rental values.

4,648,602
DICE GAME APPARATUS

Ralf P. Maroney, P.O. Box 2-151, Milford, Conn. 06460

Filed Oct. 21, 1985, Ser. No. 789,944
Int. Cl.[4] A63F 9/04; A47B 97/04, 35/00
U.S. Cl. 273—146 8 Claims



1. Dice game apparatus including:

a plurality of dice cubes,

at least one writing instrument for forming indicia on a writing surface,

means for erasing indicia formed by said writing instrument,

a bowl-like die receptacle for receiving a number of said die cubes randomly tossed into the interior thereof,

a planar bottom surface shaped in the form of a polygon

having side edges equal in number to the maximum number of players adapted to use the apparatus,

a plurality of upright sidewalls connected to said planar bottom surface, and

a continuous ledge having separately identifiable portions formed from material which can be written upon by said writing instrument seated on the top of each of said upright sidewalls for recording a score formed by said randomly tossed die cubes.

4,648,603

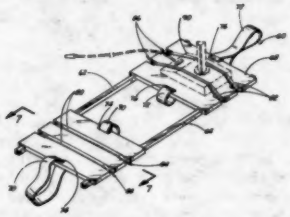
VIDEO GAME CONTROL CONSOLE

Robert L. Hayford, Jr., 2528 Orion, League City, Tex. 77573

Continuation-in-part of Ser. No. 550,372, Nov. 11, 1983, Pat. No. 4,518,164. This application May 20, 1985, Ser. No. 736,277

Int. Cl.[4] A63B *1/00*

U.S. Cl. 273—148 B **8 Claims**



2. A game control support tray for holding video game control components for a video game player, comprising:

a. a support frame defining a structure that can be held in the lap of a player; and

b. one or more control component holding tray surfaces which are on separate, spaced apart component tray members movable with respect to each other upon the support frame, the control component holding tray surfaces having means for carrying one or more control components that can be adjustably mounted upon the tray surface so that the lateral position of the component upon the tray surface can be adjusted to a position preselected by an individual game player.

4,648,604

ELIMINATION DRAW POKER GAME

Michael J. Horan, Pompano, Fla., assignor to Professional Video Association, Inc., Pompano Beach, Fla.

Filed Apr. 29, 1985, Ser. No. 728,288

Int. Cl.[4] A63F *1/00*

U.S. Cl. 273—292 **1 Claim**

1. A method of playing a card game comprising the steps of:

(a) displaying to a player five randomly selected playing cards of the type found in a conventional 52 card deck of playing cards;

(b) permitting said player to draw one or more additional randomly selected playing cards in substitution for the originally displayed cards;

(c) assigning a value to the hand of five cards remaining with said player after step (b) by recognizing the presence or absence in said hand of playing card combinations established in the game of draw poker;

(d) retiring from further play all cards utilized in the immediately preceding performance of steps (a) and (b);

(e) repeating steps (a) through (d) in sequence for a predetermined number of repetitions; and

(f) totalling the values achieved by said player in all said repetitions completed by said player within a predetermined time period.

4,648,605

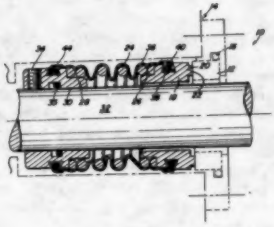
MECHANICAL SEAL ASSEMBLY

Joseph A. Marsi, Rancho Palos Verdes, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 196,967, Oct. 14, 1980, abandoned. This application Jan. 21, 1982, Ser. No. 341,408

Int. Cl.[4] F16J *3/02, 15/52*

U.S. Cl. 277—89 **3 Claims**



1. A mechanical seal assembly especially adaptable for use in the chemical industry and which is associated with a rotatable shaft and a stationary housing which may contain chemically active fluid, comprising:

a stationary seal ring connected to said housing;

a rotatable seal ring connected to said shaft;

seal faces on said seal rings opposed to one another;

a support connected to said shaft and spaced from said rotatable seal ring;

spring means positioned between said rotatable seal ring and said support for urging said rotatable seal ring toward said stationary seal ring;

an axially extending fluid impervious jacket surrounding said spring means;

said jacket having end portions extending over portions of said rotatable seal ring and said support and being separate from and supported by said spring means;

said jacket comprising shrinkable plastic shrunk onto said spring means; and

means encircling each end portion of said jacket to seal the end portions respectively to said rotatable seal ring and to said support.

4,648,606

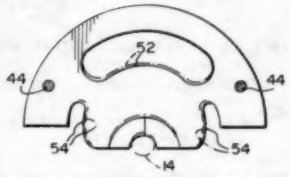
SEALS

Allan P. Brown, Ottawa, and Leonard J. Charlebois, Kanata, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jul. 8, 1985, Ser. No. 752,748

Int. Cl.[4] F16J *15/02;* **H02G** *15/00*

U.S. Cl. 277—188 R **6 Claims**



1. A seal comprising at least two sealing members which when closed together define a central aperture and provide a surface of the aperture for sealing against a substantially cylindrical article when surrounded by the seal, each sealing member comprising a resiliently flexible arcuate body having a

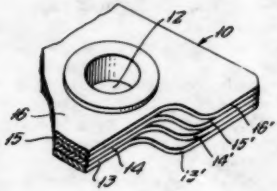
partially arcuate periphery and a concave sealing portion projecting from the body radially inwardly of the arc of the body, opposite said arcuate periphery, to provide a part of the sealing surface, the body flexibly and resiliently connected to a rigid support means located axially of the body, the support means and body connected at two fixed mounting positions spaced from and located radially outwardly of said arcuate periphery and spaced apart circumferentially around the body, each position being connected to said body by an extension projecting radially outwardly from the body between said arcuate periphery and the respective mounting position, said body being an intermediate arcuate body portion extending circumferentially between said two mounting positions and arcuate end portions extending circumferentially from opposite ends of said intermediate body portion, the intermediate body portion and end portions having freedom to move radially of the arc of the body from a normal unstrained position of the body, such that resiliently, flexibly moving the intermediate body portion about the two positions in one radial direction of the arc of the body resiliently, flexibly moves the end portions in an opposite radial direction of the arc of the body.

4,648,607

STEEL LAMINATE GASKET WITH ASSEMBLY ORDER IDENTIFICATION DEVICE

Yoshio Yamada, Koshigaya, and Hidetaka Nakasone, Omiya, both of Japan, assignors to Ishikawa Gasket Co. Ltd., Tokyo, Japan

Filed Mar. 4, 1986, Ser. No. 836,030
Int. Cl.[4] F16J *15/08*
U.S. Cl. 277—235 B **6 Claims**



1. A steel laminate gasket adapted to be situated between two engine parts of an internal combustion engine, comprising

a plurality of thin steel plates to be stacked one after another, and

means for identifying position of the steel plates formed on the steel plates where sealing ability is not affected, said means, when the steel plates are stacked in a proper order, forming a stepped portion with different height relative to a predetermined horizontal plane of the gasket to thereby allow a user to notice the proper order of assembly of the gasket.

4,648,608

LOW-COST, KEYLESS CHUCK AND METHOD OF MANUFACTURE

Peter B. Smith, Raleigh, N.C., assignor to Black & Decker, Inc., Newark, Del.

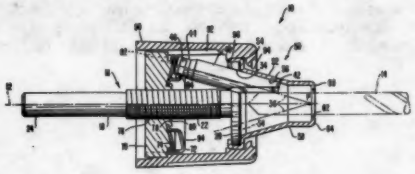
Filed Feb. 27, 1985, Ser. No. 706,273
Int. Cl.[4] B23B *31/12*
U.S. Cl. 279—1 K **10 Claims**

1. A low-cost keyless chuck having an axis, the chuck being operable in both forward and reverse rotation about the chuck axis, the chuck comprising:

a body member having a threaded shaft portion with an end configured to be drivingly rotated about the chuck axis, said body member also having a plate portion rigidly connected to said threaded shaft portion, the plate portion having a peripheral edge and being oriented perpendicular to said threaded shaft portion and located distant said shaft end;

a plurality of apertures formed in said plate portion and spaced about the chuck axis of rotation, said apertures having respective axes converging on said chuck axis at a point distant said plate portion;

a plurality of jaw members each slidably disposed in a respective one of said apertures, said jaw members having respective work-piece-gripping ends positioned to converge on said chuck axis, said jaw members also having respective opposed ends which diverge from said chuck axis;



a hollowed tapered member having a larger diameter portion and a smaller diameter portion, said larger diameter portion being rigidly fixed to said plate portion, wherein said hollow tapered member is crimped to said peripheral edge of said plate portion, said tapered member partially enclosing said jaw members, said tapered member having at least one corrosion resistant inside tapered surface distant said plate portion for guiding said jaw members during movement of said jaw members along said aperture axis; and

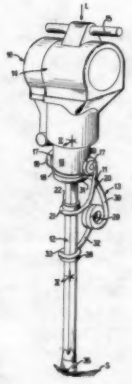
nut means connected to said jaw members and engaging said threaded shaft portion for advancing and retracting said jaw members along said aperture axes upon actuation said nut means.

4,648,609

DRIVER TOOL

Robert F. Deike, Cheyenne, Wyo., assignor to Construction Robotics, Inc., Chicago, Ill.

Filed Jan. 22, 1985, Ser. No. 693,374
Int. Cl.[4] B25D *17/08*
U.S. Cl. 279—19.1 **7 Claims**



1. An easily removable spring attachment for a power hammer of the type having a casing, a tool suspending yoke depending from the casing, an anvil head slidable in the casing, a tool having a rod portion projecting into the casing with an end engaging said anvil head in the casing, said rod portion

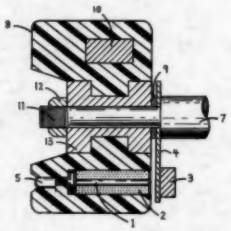
slidable through said yoke and having a first collar bottoming on the yoke to maintain the end of the rod in the casing and a driving piston in the casing impacting said anvil to drive the tool, which comprises a second collar on said rod portion of the tool spaced below the yoke, a replaceable external torsion spring having a first arm with a first eye end freely bottomed on said casing and a second arm with a second eye end freely bottomed on said second collar of the tool, said torsion spring being effective to hold the tool on the work and to space the anvil head from the driving piston, said second eye end being larger than said first eye end and said first collar to facilitate removal of the tool when the yoke is removed from the tool.

4,648,610

LIGHT EMITTING ROLLER SKATE WHEELS

James A. Hegyi, 15901 W. Mayflower Dr., New Berlin, Wis. 53151

Filed Jul. 22, 1985, Ser. No. 757,680
Int. Cl.[4] A63C *17/26*
U.S. Cl. 280—11.19 **2 Claims**



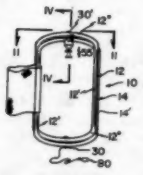
1. A light emitting roller skate wheel including, in combination, a permanent magnet, an electrically conducting coil embedded in the body of said wheel, a light emitting means embedded in the body of said wheel and electrically connected to said coil so that electrical energy generated by said coil energizes said light emitting means, said coil moving in a circular path upon rotation of said wheel, characterized in that a coil core composed of material capable of being magnetically attracted by said magnet is embedded in the body of said wheel so that said coil encircles said core, said magnet being mounted nonrotatably externally to the body of said wheel and extending for an arcuate portion of said circular path so that upon rotation of said wheel said core is periodically in a magnetic flux coupling relationship with said magnet, said coil being periodically in a magnetic flux coupling relationship with said core, so that said coil periodically generates electrical energy.

4,648,611

FOLDABLE SLED OR TOBOGGAN

Ivica J. Kekich, 1827 Parkhurst Ave., London, Ontario, Canada (N5V 2C4)

Filed May 30, 1985, Ser. No. 739,179
Int. Cl.[4] B62B *13/16*
U.S. Cl. 280—20 **4 Claims**



1. A foldable sleigh comprising:

(a) two identical closed loop members, each fashioned from a single length of material into a generally elongated loop wherein two of the opposite sides are longer than the other two opposite sides and the longer sides are essentially parallel to each other, while the shorter sides are respectively similarly curvilinear, each of the shorter sides defining essentially as a mid-point therealong, a pivot point;

(b) one loop member lying in a first plane, the other in a second plane;

(c) a first and a second pivot means, each pivot means connected to a pivot point in one of each of the said loop members whereby to hold the two loop members in adjacent yet cascading relationship;

(d) a moving clasp including major and minor pairs of fingers, the fingers of each pair opposite each other and each said minor finger disposed between each said major finger, each said minor finger spaced from its adjacent major finger on each side by a slot complementary to the cross sectional shape of said loop members, the clasp carried for linear movement along the pivot axis by one of the pivot means, said minor fingers being shorter along the pivot axis than the major fingers and adapted to slidingly extend past a portion of an adjacent curvilinear side of both loop members to selectively constrain the loop members in said slots in their planes that on the one hand are oriented at approximately 90°, and on the other hand at approximately 12°; and,

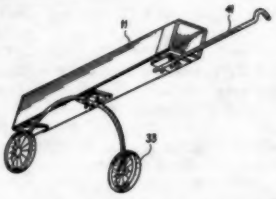
(e) means for biasing the moving clasp so that the major and minor fingers index into intersection with, on the one hand, one of said adjacent curvilinear sides, and on the other hand, with both of said curvilinear sides, while allowing said fingers to be removed from said indexing and against the biasing means.

4,648,612

GOLF CART

Young G. Park, #KA-305, Dong-A, Apt. #902 Daechi-dong, Kangnam-ku, Seoul, Rep. of Korea (135-00)

Filed Dec. 12, 1985, Ser. No. 808,033
Claims priority, application Rep. of Korea, Jul. 10, 1985, 85-8634; Jul. 23, 1985, 85-9288
Int. Cl.[4] B62B *1/20*
U.S. Cl. 280—47.26 **7 Claims**

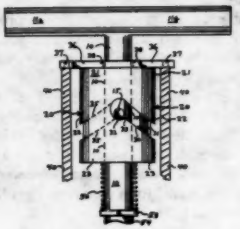


1. A golf cart for carrying golf clubs, said golf cart comprising upper, middle and lower saddle arms, a golf bag having an inside surface and an outside surface, a backbone plate, two L-shaped reinforcing angles, two washer plates, a pulling handle, an arch type wheel assembly and securing means; said upper, middle and lower saddle arms being interposed between said inside surface of said golf bag and said backbone plate to hold the golf clubs in said golf bag, said reinforcing angles being disposed on said backbone plate and defining a U-shaped channel, said washer plates being disposed on said outside surface of said golf bag, said pulling handle being disposed on the exterior of said golf bag and on one of said washer plates, said wheel assembly being disposed on the exterior of said golf bag and on the other of said washer plates, and said securing means securing together in detachable assembled relationship said saddle arms, backbone plate, reinforcing angles, washer plates, pulling handle and wheel assembly.

4,648,613
SAFETY DESIGN NEWSPAPER INSERT CART

James J. Hennessy, Chambersburg, Pa., assignor to Hennessy Products, Inc., Chambersburg, Pa.

Filed Jul. 17, 1985, Ser. No. 755,920
Int. Cl.[4] B62B 5/04
U.S. Cl. 280—79.1 A 1 Claim



1. A newspaper advertising insert cart having enhanced safety features incorporated therein, said insert cart comprising:

a base member (60),

a plurality of roller caster members (62) on a lower portion of said base member (60),

an aperture (61) extending through said base member (60),

an elongated one-piece rod (10) extending through said aperture (61) at a lower portion of said one-piece rod,

an upper end of said one-piece rod (10) having cross-handle means (11*a*, 11*b*) affixed thereto,

said one-piece rod (10) having a pivot pin (15) mounted thereto at a portion of said rod between said cross-handle means and said rod lower portion, said pivot pin (15) extending outwardly from both sides of said rod (10) and capable of assuming an upper or brake-off position and a lower or brake on position,

a spring collar means (53) fixedly mounted to said one-piece rod (10) at a position thereon below said pivot pin (15),

a clamping cam assembly (20) having at least a middle zone (22) thereon, said middle zone (22) having sloped slot means (30,35) thereon for receipt of the ends of said pivot pin (15),

said clamping cam assembly (20) having a lower zone (23) thereon comprising a reduced area for guidance of said rod (10) extending therethrough,

spring means (50) mounted around said rod (10) and between said lower zone (23) of said clamping cam assembly (20) and the spring collar means (53),

said clamping cam assembly (20) further comprising an upper zone (21) above said middle zone (22), said upper zone (21) having affixed thereto a cover plate means (36) for prevention of injury to the insert cart user,

vertical means (40) extending between said base member (60) and said cover plate means (36),

means (37) for affixing said cover plate means (36) to said vertical means (40) whereby said clamping cam assembly (20) is entirely isolated for protection of a workman using the insert cart,

wherein said sloped slot means (30,35) in said middle zone (22) comprises two slots each extending for approximately ninety degrees around the circumference of said clamping cam assembly (20),

wherein each of said slots (30,35) has a lower wall portion means (31) for stopping the traverse of said pin (15) relative to the clamping cam (20) and wherein

each of said slots (30, 35) has a groove (32) formed in an upper portion thereof by reason of an extending lip means (33),

said groove and lip structure means serving to hold pin (15) in the upper or brake-off position,

wherein said vertical means (40) comprise four sectional divider elements for providing four sections or areas for loading newspaper inserts onto the insert cart,

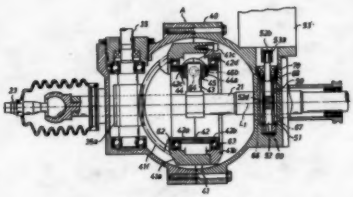
wherein said spring means (50) is a compression spring and serves to force collar (53) and thereby rod (10) downwardly when pin (15) is disengaged from groove (32) in slot (30) by rotation of said crosshandle means (11*a*, 11*b*),

wherein said cover plate means (36) has aperture means (38) formed therein for passage of rod (10) therethrough.

4,648,614
STEERING SYSTEM IN WHEELED VEHICLE

Youichi Hyodo, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jan. 8, 1986, Ser. No. 817,123
Claims priority, application Japan, Jan. 11, 1985, 60-3797
Int. Cl.[4] B62D 3/02
U.S. Cl. 280—91 3 Claims



1. A steering system in a wheeled vehicle, comprising a front-wheel steering linkage arranged to be operated by a steering wheel, a rear-wheel steering linkage including a lateral control shaft operatively connected at the opposite ends thereof with a pair of rear steerable road wheels, a rotary shaft extending longitudinally in a fore-and-aft direction of the vehicle and operatively connected at the front end thereof with said front-wheel steering linkage, and a rear-wheel steering mechanism operatively connected to the rear end of said rotary shaft for effecting axial displacement of said lateral control shaft in response to rotary motion of said rotary shaft,

wherein said rear-wheel steering mechanism comprises a housing mounted on a body structure of the vehicle for rotatably supporting thereon said lateral control shaft, a first cylindrical carrier body mounted within said housing for rotation about a vertical axis perpendicular to the central axis of said lateral control shaft and drivingly connected to the rear end of said rotary shaft to be rotated in response to operation of said front-wheel steering linkage, a second cylindrical carrier body mounted within said first cylindrical carrier body for rotation about the central axis of said lateral control shaft, a radial rod integral with said lateral control shaft and arranged within the interior of said second cylindrical carrier body, said radial rod extending perpendicular to the central axis of said control shaft, a universal joint assembly mounted within said second cylindrical carrier body for slidably supporting said radial rod of said control shaft, and an actuator assembly mounted on said housing for rotating said lateral control shaft.

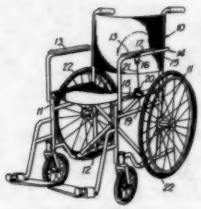
4,648,615
WHEELCHAIR WIDTH ADJUSTER

Frank Volin, 3221 Quitman St., Columbia, S.C. 29402

Continuation-in-part of Ser. No. 554,288, Nov. 22, 1983, abandoned. This application Nov. 6, 1985, Ser. No. 795,408
Int. Cl.[4] B62M 1/14
U.S. Cl. 280—242 WC 5 Claims

1. A width adjusting attachment for a laterally folding wheelchair having a side frame including an arm rest and a vertically displaceable seat frame bar below the arm rest, said attachment comprising a pair of mounting plates arranged

vertically and engaging opposite sides of said side frame near and below the arm rest and near the front of said side frame, releasable means securing said mounting plates to said side frame, a horizontal shaft journaled on said mounting plates near the forward ends thereof, a cable winding and unwinding element on said shaft between said mounting plates, an idler pulley between said mounting plates rearwardly of the cable winding and unwinding element and being journaled on the mounting plates, an anchoring element fixed to said vertically displaceable seat frame bar substantially below the idler pulley,



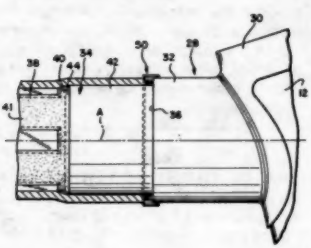
a length of cable connected between said anchoring element and said cable winding and unwinding element, and a manual lever pivotally attached to said horizontal shaft near one mounting plate adjacent to the outer side of said side frame, said lever being swingable on its pivot axis toward and away from said side frame and also being rotatable in a vertical plane adjacent to the outer side of said side frame to turn said shaft and said cable winding and unwinding element, and a rest element for said lever on the mounting plate adjacent to the outer side of said side frame and resisting rotation of the lever in one direction.

4,648,616

FRAME JOINT CONSTRUCTION FOR BICYCLES AND THE LIKE

Robert L. Diekman, Kent, and V. Daniel Downing, Maple Valley, both of Wash., assignors to Huffy Corporation, Dayton, Ohio

Filed Oct. 4, 1985, Ser. No. 784,420
Int. Cl.[4] B62K *19/22*
U.S. Cl. 280—281 R **15 Claims**



9. For use with a frame of the type including tubular components connected at ends therof by bracket means, a joint construction comprising:

stub insert means adapted to be attached to bracket means, said stub insert means including base means with a substantially annular shoulder and stub means extending outwardly from said shoulder;

means having a tubular end telescoping over said stub means and terminating in a substantially annular end face; and

collet means positioned on said stub means between said shoulder and said end face, said collet means having an inner end engaging said shoulder, and an outer end engaging said end face;

said inner end including a first lip portion sized to extend about a periphery of said base means adjacent to said shoulder;

said outer end including a second lip portion sized to extend about a periphery of said tubular end adjacent to said end face, said end face, said second lip portion including an annular, concave, beveled surface engaging said end face; and

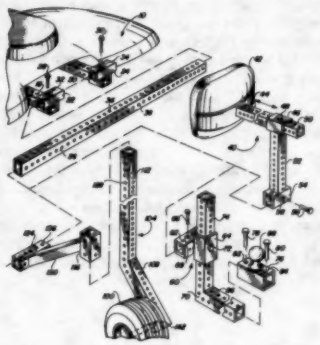
said first lip portion being substantially annular in shape and including an annular inside wall contacting said periphery of said base means and a seat, adjacent to said inside wall, abutting said shoulder.

4,648,617

CONVERTIBLE LOAD CARRYING APPARATUS FOR ALL TERRAIN VEHICLES

Gerald J. Hannappel, 708 W. Solano Dr., Phoenix, Ariz. 85013

Continuation-in-part of Ser. No. 520,150, Aug. 4, 1983, Pat. No. 4,522,420. This application Jun. 6, 1985, Ser. No. 741,768
Int. Cl.[4] B62J *7/04, 9/00*
U.S. Cl. 280—289 A **22 Claims**



1. Convertible load carrying apparatus for attachment to the frame of an all terrain vehicle, said apparatus comprising in combination:

(a) support means extending from the frame of the vehicle;

(b) a load bar;

(c) means for detachably mounting said load bar upon said support means;

(d) load associated means, said load associated means being uniquely configured to comport with the load to be attached to the vehicle, said load associated means comprising a pair of legs and a rotatably mounted wheel located at the lower end of each of said pair of legs, a first stanchion for interconnecting one of said legs with said load bar and including a first sleeve for penetrably receiving said load bar and a second sleeve for penetrably engaging said one leg, a second stanchion for interconnecting one of said pair of legs with said load bar and including a third sleeve for penetrably receiving said load bar and a fourth sleeve for penetrably engaging said other leg and means for adjustably locating said first and third sleeves along said load bar and further means for adjustably locating said one and said other legs relative to said second and third sleeves, respectively; and

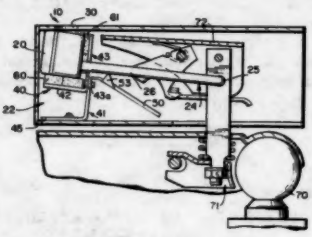
(e) means for detachably attaching said load associated means with said load bar.

4,648,618

TRAILER COUPLER LOCK WITH PROTECTIVE HOUSING

Leslie H. Utman, 7414 Big Cypress Dr., Miami Lakes, Fla. 33014, and M S Rifkin, 50 E. 10th Ct., Hialeah, Fla. 33010

Filed Jun. 11, 1985, Ser. No. 743,358
Int. Cl.[4] B60D *1/12*
U.S. Cl. 280—507 **18 Claims**



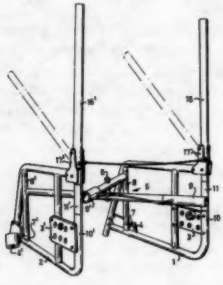
1. A locking device for an assembled trailer hitch having a clamp actuator for releasing it from its assembled position, said device comprising a U-shaped shackle having a closed end and two legs extending therefrom defining an open end; means for allowing operative connection of said U-shaped shackle at the closed end thereof to said clamp actuator; means for substantially completely covering said clamp actuator and said shackle to prevent access thereto and operation thereof, said means including a housing member having an open front end thereof for allowing sliding movement of said housing member over said clamp actuator and said shackle; and locking means for operatively engaging the legs of said U-shaped shackle and for operatively engaging said housing member so that selectively said housing member may not be moved with respect to said clamp actuator to allow access to and operation of said clamp actuator to release the assembled hitch; said locking means comprising a key operated lock; and means for mounting said lock adjacent a closed rear end of said housing member, said mounting means comprising means for mounting said lock so that it can move about six degrees so that it floats and therefore can readily move into alignment with the legs of said shackle.

4,648,619

COLLAPSIBLE WHEELCHAIR CHASSIS

Jarl O. Jungnell, Vällingby, and Bo P. Sköld, Spånanga, both of Sweden, assignors to Molnlycke AB, Gothenburg, Sweden

Filed Oct. 3, 1985, Ser. No. 783,440
Claims priority, application Sweden, Mar. 8, 1985, 8501159
Int. Cl.[4] B62B *3/02*
U.S. Cl. 280—650 **5 Claims**



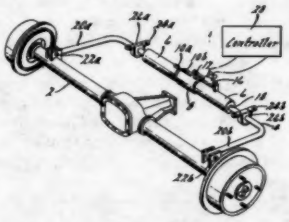
1. Collapsible wheelchair chassis comprising; two side frames joined by a single pair of horizontally disposed cross braces; a pivot joint provided at the middle of said horizontally disposed braces; horizontally disposed guide sleeves in which said braces are slidable; a first set of axially indisplaceable vertically mounted sleeves, said first set of sleeves being pivotally mounted on a first set of stubs, said stubs comprising part of said side frames; and a second set of axially indisplaceable vertically mounted sleeves, said second set of sleeves being pivotally mounted on a second set of stubs, said second stubs also comprising part of said frame; wherein, a front end side of each brace of said pair of braces is rigidly attached to said first vertically mounted sleeves, a rear end of each brace of said pair of horizontal braces is telescopically displaceable in said horizontal guide sleeves, and said horizontal guide sleeves are rigidly connected to said second set of vertically mounted sleeves; said chassis further comprising locking devices disposed in each said horizontal guide sleeve to lock said chassis in an erected state.

4,648,620

ADJUSTABLE SUSPENSION STABILIZER BAR

Sheldon E. Nuss, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 20, 1985, Ser. No. 736,184
Int. Cl.[4] B60G *11/18*
U.S. Cl. 280—689 **15 Claims**



7. A suspension system for a vehicle having multiple road wheels comprising an adjustable stabilizer bar, which stabilizer bar comprises:

a primary torsional reaction segment pivoted to the chassis of said vehicle;

linkage connecting said primary reaction segment with the suspension of said roadwheels such that said primary reaction segment will be torsionally loaded during jounce and rebound motion of said roadwheels; and

means for selectively increasing the torque reactive capacity of said primary reaction segment, said means comprising one or more secondary tubular reaction segments encasing a portion of said primary reaction segment and associated means for interconnecting said primary and secondary reaction segments.

4,648,621

METHOD OF ADJUSTING VEHICLE HEIGHT

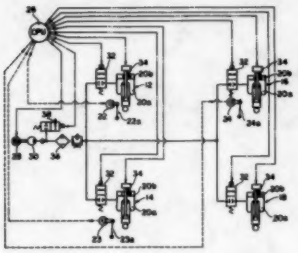
Yuji Yokoya; Shuuichi Buma; Hitoshi Araki; Hiroshi Miyata, all of Toyota; Masanori Hirose, and Kaoru Ohashi, both of Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 1, 1985, Ser. No. 729,555
Claims priority, application Japan, Aug. 25, 1984, 59-177058
Int. Cl.[4] B60G *11/26*
U.S. Cl. 280—707 **5 Claims**

5. A method of adjusting the height of a vehicle which includes an air suspension for adjusting the vehicle height and having first and second air chambers being being communicated with and shut off from each other, comprising the steps of:

shutting-off temporarily said first air chamber from the second air chamber;

supplying the compressed air to the second air chamber not later than the shutting-off of the first air chamber; and



affording communication between said second air chamber and said first air chamber through a throttle before the vehicle reaches a predetermined height so as to increase the height of said vehicle.

4,648,622

SUSPENSION DEVICE FOR AUTOMOBILE

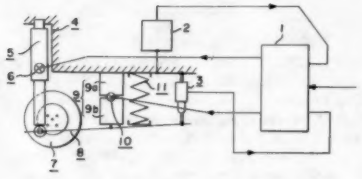
Shunichi Wada; Setsuhiro Shimomura, both of Himeji; Naotake Kumagai, Aichi; Shozo Takizawa, Okazaki; Mitsunori Maruyama, Okazaki; Minoru Tatemoto, Okazaki; Hiroyuki Takada, Okazaki, and Mitsuhiko Harara, Okazaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and Mitsubishi Jidosha Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Continuation of Ser. No. 643,539, Aug. 23, 1984, abandoned. This application Jun. 10, 1986, Ser. No. 873,160

Claims priority, application Japan, Aug. 24, 1983, 58-155600

Int. Cl.[4] B60G *17/04*

U.S. Cl. 280—707 **5 Claims**



1. A suspension device for an automobile, comprising: a shock absorber provided with a damping force change-over mechanism;

sensor means including means for detecting horizontal and vertical vibration of the vehicle body; and

control device which detects a sustaining time period of an output of said sensor means exceeding a determination value, said control device outputting a change-over for changing a damping force of said shock absorber to a large value only when said sustaining time period exceeds a predetermined time period, and outputting a signal for maintaining the damping force of said shock absorber to be a large value for a predetermined time period even through the output of said sensor disappears.

4,648,623

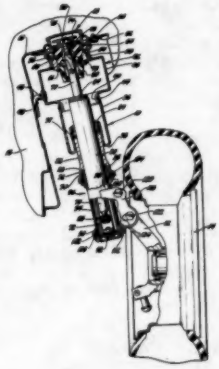
VEHICLE SUSPENSION STRUT WITH LOWER ROTARY BEARING CUP ASSEMBLY FOR A DIRIGIBLE ROAD WHEEL

David S. Cameron, Grosse Pointe Woods, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 28, 1986, Ser. No. 834,396

Int. Cl.[4] B60G *15/06, 17/00*

U.S. Cl. 280—711 **4 Claims**



1. Spring suspension strut for operatively connecting a dirigible road wheel assembly to support structure in a vehicle comprising a lower bearing cup operatively mounted to a steering knuckle of the road wheel assembly, a suspension strut, said strut having a cylindrical outer support tube with a lower extremity mounted in said lower bearing cup and extending upwardly therefrom, said strut having a piston operatively mounted therein and having a piston rod extending outwardly therefrom, upper mount means connecting said piston to the support structure. suspension spring means operatively mounted between said support tube and said upper mount means, and bearing means interposed between said lower cup and said lower extremity of said outer support tube so that said steering knuckle and said road wheel can be turned relative to said suspension strut for steering said road wheel assembly.

4,648,624

FIXING DEVICE FOR A TUBULAR PART, IN PARTICULAR FOR THE STEERING COLUMN OF A VEHICLE

Frédéric Mouhot, Voujeaucourt; Jean-Pierre Barnabe; André Hoblingre, both of Valentigney, and Michel Clerc, Valentigney, all of France, assignors to Cycles Peugeot, Valentigney, France

Filed Nov. 6, 1985, Ser. No. 795,598

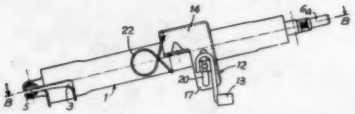
Claims priority, application France, Sep. 30, 1985, 85 14471

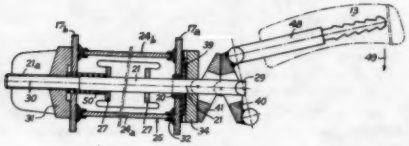
Int. Cl.[4] B62D *1/18*

U.S. Cl. 280—775 **12 Claims**

1. Fixing device for a tubular part such as a vehicle steering column (1) which can be adjusted continuously by means of pivoting and/or telescopic axial displacement, comprising a support piece (14) provided with means (15, 16) for fixing it rigidly to a fixed part such as the body of a vehicle and consisting of two substantially parallel lateral flanges (17) joined to each other at one of their ends so as to form a U-shaped structure which can be adjusted so as to move the flanges (17) towards or away from each other, ensuring fixing of the tubular part (1) by clamping a middle support piece (25) through which the tubular part (1) passes by means of a tie rod (21)

passing through the lateral flanges (17) and the support piece (25) in a transverse direction and provided with two bearing stops (29, 31) at its ends situated outside and on either side of the lateral flanges (17), and by means of at least one clamping device opeated by a handle (13) bearing against one of the stops (29) and against the external face of the corresponding flange (17) so as to move the flanges (17*a*, 17*b*) towards each other in the transverse direction or, on the other hand, so as to allow them to be separated by means of elastic return, the tie rod (21) passing through the flanges (17) by way of elongated apertures (20) to permit pivoting of the tubular part (1) and/or the tubular part having two parts telescopically mounted for sliding in the axial direction, wherein the clamping device is constructed in the form of a bistable toggle-joint device which has three hinging axes (51, 52, 53) parallel to each other and perpendicular to the axial direction of the tie rod (21) and consists of two levers (40, 41) having hole passing through their entire thickness and engaged with play onto the tie rod (21), in succession, between one end of this rod comprising the stop (29) with a hinging surface and a part (34) bearing against the lateral flange (17*a*), which part is engaged onto the tie rod (21) and has a hinging surface pointing in the opposite direction to the lateral flange (17*a*), each of the levers (40, 41) comprising, on one of their faces which are transverse in relation to the axis of the tie rod (21), a hinging surface (male and female) (44, 44') and, on their other transverse face, another hinging surface (male or female) (43, 43') and each comprising,





on their opposing faces two flat bearing surfaces (45*a*, 45*b* and 45'*a*, 45'*b*) each intended to cooperate with a corresponding surface of the other lever.

the first lever, situated towards the outside, being integral with the operating handle and being freely engaged via one of its hinging surfaces (male or female) (43, 44) with the hinging surface (29) of the tie rod (21) and via its other hinging surface (43, 44) with the corresponding hinging surface (43', 44') of the second lever (41).

the second lever (41) being freely engaged via one of its hinging surfaces (male or female) (43', 44') with the corresponding hinging surface (43, 44) of the first lever (40) and via its other hinging surface (43', 44'') with the hinging surface (36) of the bearing part (34).

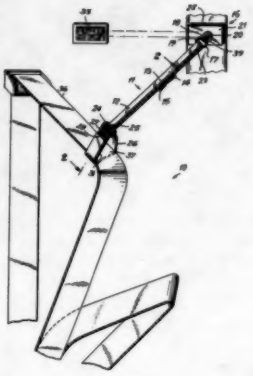
the coresponding bearing surfaces (45*a*, 45'*a* and 45*b*, 45'*b*) of the levers (40, 41) being inclined and the axes of the hinging surfaces being arranged on the levers (40, 41) in such a way that, in a first bearing position of the levers (40, 41) or clamping arrangement, the three hinging axes (51, 52, 53) are substantially coplanar and that in a second bearing position of the levers (40, 41), or unclamped position, the middle hinging axis (52) is clearly outside the plane defined by the two other axes (51, 53) the movements from one position to another being obtained by tilting the first lever (40) in either direction, by means of the handle (13), until the corresponding bearing surfaces (45*a*, 45'*a* or 45*b*, 45'*b*) come up against each other.

4,648,625

SEAT BELT TENSION RELIEF DEVICE

James P. B. Lynch, No. 1, Hartsborn La., West Nyack, N.Y. 10994

Filed Jun. 28, 1985, Ser. No. 749,672
Int. Cl.[4] B60R *22/00*
U.S. Cl. 280—808 9 Claims



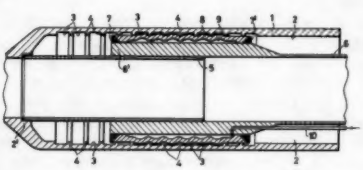
1. A seat belt tension relief device for a vehicle seat belt having a passenger torso engaging portion comprising: an elongated elastic member, means pivotally mounting one end of said elastic member to a vehicle frame member and a means attached to the other end to engage the torso engaging portion of the seat belt, said means to engage comprising a flexible member in the form of a band having first and second Velcro strips attached at respective opposite sides and ends of the band, said means to engage further including a stiffened plate bonded to one side of the band intermediate the two ends of the band, wherein when the flexible member is placed around the seat belt and the Velcro strips are engaged, the flexible member takes the form of a triangular loop with the stiffened plate defining one side of the triangle, the torso engaging portion of the seat belt engages the stiffened plate, and wherein the flexible member is attached to said elastic member opposite the side defined by the stiffened plate, whereby the device elastically holds the seat belt above the wearer and relieves the strain of the seat belt on the torso of the wearer.

4,648,626

TELESCOPIC JOINT FOR REPAIRING UNDERWATER PIPELINES LAID AT A GREAT DEPTH

Constantino Vinciguerra, Florence, and Giampaolo Bonfiglioli, Inzago, both of Italy, assignors to Nuovo Pignone S.p.A., Florence and Snam S.p.A., Milan, both of, Italy

Filed Jul. 31, 1985, Ser. No. 760,888
Claims priority, application Italy, Aug. 7, 1984, 22248 A/84
Int. Cl.[4] F16L *55/12*
U.S. Cl. 285—15 5 Claims



1. A telescopic joint for the repair of damaged sections of an underwater pipeline, said joint comprising an inner cylinder

which is telescopically slidable within an outer rigid sleeve of high-tensile steel, an annular sheath of steel having a yield point not more than one half that of said outer sleeve welded to a predetermined segment of an outer surface of said inner cylinder in a manner such that said annular sheath forms with said inner cylinder an annular chamber such that said sheath is permanently expanded radially by means of pressure introduced into said chamber to engage an inner surface of said outer rigid sleeve, and an inner tube constructed of the same material as said underwater pipeline to be repaired, said inner tube welded coaxially to one end of said outer sleeve, acting as a slide guide for said inner cylinder.

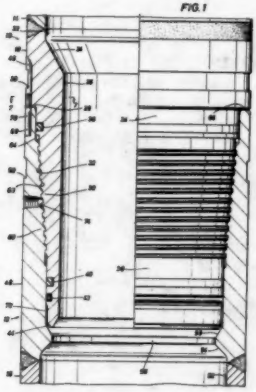
4,648,627

STABBING CONNECTOR

Larry E. Reimert, Houston, Tex., assignor to Dril-Quip, Inc., Houston, Tex.

Filed Jan. 18, 1984, Ser. No. 571,850
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—24 **29 Claims**

FIG. 1



1. A connector assembly comprising:

a. a first connector member including a neck portion featuring external threads;

b. a second connector member including a collar portion featuring internal threads which may threadedly engage with said external threads with said neck portion of said first member being received within said collar portion of said second member;

c. first and second seal means for providing sealing engagement between said first and second members at axially spaced first and second general locations, respectively, when said neck portion of said first member is received within said collar portion of said second member, thereby defining an annular region between said first and second general locations and between said first and second members; and

d. fluid pressure communication means whereby fluid pressure may be selectively applied to said annular region when said neck portion of said first member is received within said collar portion of said second member;

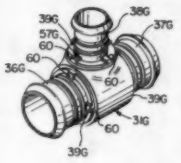
e. wherein said neck portion of said first member may be received at least partially within said collar portion of said second member, with said members mutually aligned about their longitudinal axes and such fluid pressure may be applied by means of said fluid pressure communication means to radially expand said annular region to permit said external and internal threads to clear allowing full insertion of said first member into said second member without relative rotation therebetween and in which position said threads engage upon reduction of said fluid pressure.

4,648,628

BRANCHED HOSE CONSTRUCTION, T-CONNECTOR THEREFOR AND METHODS OF MAKING THE SAME

Roger D. Meadows; James B. Rush, both of Waynesville, and James S. Bryan, Haywood County, all of N.C., assignors to Dayco Products, Inc., Dayton, Ohio

Filed Sep. 19, 1985, Ser. No. 777,804
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—24 **8 Claims**



1. In a branched hose construction comprising a T-connector having a body portion provided with a pair of substantially oppositely directed legs extending therefrom and an outwardly directed branch leg extending therefrom intermediate said pair of legs, three tubular hoses respectively telescoped onto said legs to be disposed in fluid communication with each other through said T-connector, each said hose having an outer peripheral surface and an annular end surface, said body portion having an external peripheral surface adjacent said legs thereof, said body portion having an annular shoulder adjacent each leg thereof against which said annular end surface of its respective hose abuts and which is of a size that causes said external peripheral surface of that respective hose to substantially mate with and thereby be substantially flush with said external peripheral surface of said body portion that is adjacent that respective hose, an annular clamping means respectively disposed about said hoses and clamping the same against their respective legs of said T-connector, the improvement wherein each said annular shoulder of said T-connector has an outwardly extending projection means thereon and each said hose has said annular end surface thereof deformed around said projection means of its respective annular shoulder by its respective clamping means so as to substantially embed said projection means therein.

4,648,629

UNDERWATER CONNECTOR

Hollis A. Baugh, Houston, Tex., assignor to Vetco Offshore, Inc., Ventura, Calif.

Filed May 1, 1985, Ser. No. 729,460
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—26 **26 Claims**

1. A control pod connector assembly comprising:

a lower fixed member having an upwardly facing interface surface, and a plurality of fluid openings therein;

an upper removable member having a downwardly facing interface surface with a plurality of fluid openings therein adapted to mate with the corresponding fluid openings of said lower member;

means for sealing around the mated fluid openings;

said lower member having a centrally located vertical cylindrical opening and an inwardly extending annular first shoulder;

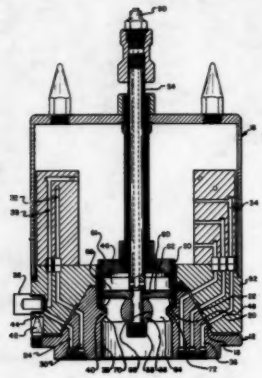
said upper member having a centrally located vertical cylindrical opening and an inwardly extending annular second shoulder;

said first and second shoulders in close proximity when the two member are mated, the upper surface of said second shoulder and the lower surface of said first shoulder converging toward the center of said cylindrical openings;

a centrally located axially extending latch rod;

a spherical ball secured to the end of said latch rod;

a plurality of outwardly extending lock dogs each having an inner surface complimentary with said ball and located in contact with said ball, the outer surface having a horizontally circumferentially extending groove complimentary with said first and second shoulders;



said dogs when in contact with said ball having an outer surface of a diameter greater than the inside diameter of said first and second shoulders, but less than the inside diameter of the vertical opening through said upper member;

means for securing said ball at a locking elevation substantially that of said shoulders;

means for axially moving said ball to a position remote from said locking elevation whereby said lock dogs rock loose from said shoulders.

4,648,630

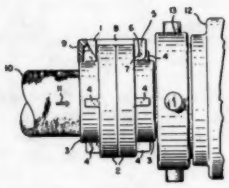
FIRE HOSE COUPLING LOCK

George H. Brush, Thurston County, Wash., assignor to David A. Zornes, Tacoma, Wash.

Continuation-in-part of Ser. No. 467,028, Feb. 16, 1983, abandoned. This application Jul. 1, 1985, Ser. No. 750,888

Int. Cl.[4] F16L *15/00*

U.S. Cl. 285—87 **6 Claims**



1. A locking means for preventing accidental releasing rotation of one elongated conduit with respect to another elongated conduit, which conduits are joined together by coupling means of the type wherein the end of each conduit to be coupled is adapted to be coupled to a substantially identical conduit end when the two conduit ends are aligned and abutted to one another and rotated with respect to one another about the longitudinal axis of the conduits to form a water-tight joint between the two conduits, each conduit end including a coupling face on the projecting end thereof, and an annular portion adjoining the coupling face such that when two conduit ends are joined an annular ridge is formed by said annular portions, said locking means comprising:

a mounting means fixed to an exterior surface of one of said coupling faces; and

a locking bar means, pivotably mounted on said mounting means, which bar extends across said joint to the outer edge of said annular ridge formed by the joining together of two coupling faces, said bar means including a means for gripping said outer edge and urging said coupling together, whereby said locking bar, when pivoted into secure contact with said outer edge, urges said coupling faces together with sufficient force so that during pressurization of said conduits, separation of one coupling face with respect to the other is prevented.

4,648,631

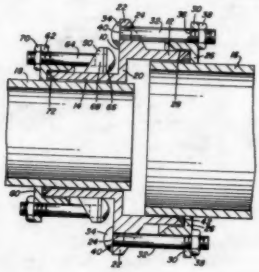
REDUCING COUPLING

Donald L. Bryant, Texarkana, Ark., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Dec. 19, 1985, Ser. No. 810,637

Int. Cl.[4] F16L *23/00*

U.S. Cl. 285—177 **4 Claims**

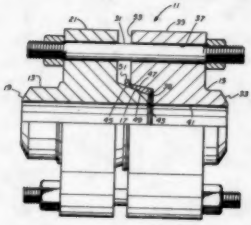


1. A coupling for connecting the ends of two pipes of different diameters comprised of a body having a radially extending wall, first and second sleeve portions axially extending in opposite directions from said wall, said first sleeve portion being adapted to telescopically receive the end of the larger of the two pipes and said second sleeve portion being adapted to telescopically receive the end of the smaller of said pipes, a plurality of circumferentially spaced ears projecting radially outward from the periphery of said first sleeve portion at said wall, openings through said ears, a plurality of circumferentially spaced sets of two lugs projecting radially outward from the periphery of said second sleeve portion closely adjacent said wall, the space between the two lugs in each set opening radially outward, first and second followers associated respectively with ends of said first and second sleeve portions, first and second series of bolts extending from said ears and lugs to respective followers associated with said first and second sleeve portions, the heads of said first and second series of bolts being adjacent said ears and said lugs respectively, said ears and said lugs are axially spaced a distance less than the sum of the axial length of a bolt head in said first series of bolts and the axial length of the bolt head in the second series of bolts which is circumferentially align therewith, and at least one of said ears is circumferentially aligned with one of said sets of lugs.

4,648,632
HIGH PRESSURE FLOW LINE CONNECTION

Robert C. Hagner, Houston, Tex., assignor to Bas-Tex Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 411,498, Aug. 25, 1982, Pat. No. 4,452,474. This application Jun. 22, 1983, Ser. No. 506,698
Int. Cl.[4] F16L *25/00*
U.S. Cl. 285—334.1 6 Claims



1. A high pressure flow line connection, which comprises:

a tubular male member having an end portion with an in wardly tapered frusto-conical exterior surface having a minimum outside diameter and an angle of taper with respect to the axis of the male member and an axial length, said tapered exterior surface terminating in an end having a minimum outside diameter, said minimum and maximum outside diameters being subject to manufacturing tolerances, said male member including a radially outwardly extending flange adjacent said maximum outside diameter;

a tubular female member coaxially generally matingly aligned with said male member and including an end portion having an outwardly tapered frusto-conical interior surface having an angle of taper with respect to the axis of the female member that is less than the angle of taper of the end portion of the male member and said female member end portion interior surface terminating at an outer end having a maximum inside diameter and at an inner end having a mimimum inside diameter, said female member including a radially extending flange adjacent said maximum inside diameter and a radially inwardly extending shoulder adjacent said minimum inside diameter, said female member interior surface having an axial length between said shoulder and said female member flange;

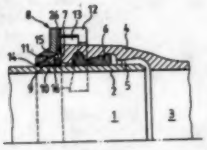
means for urging said flanges of said male and female members toward each other;

and a seal ring including a frusto-conical inner surface having an angle of taper substantially equal to the angle of taper of the male member end portion exterior surface and a frusto-conical outer surface having an angle of taper substantially equal to the angle of taper of the female member end portion interior surface and said seal ring including an annular lip extending radially outwardly from said seal ring outer surface adjacent the maximum outside diameter of said seal ring surface, said seal ring being positioned coaxially between said male and female members with said seal ring inner surface engaging said male member end portion exterior surface and a portion of said seal ring outer surface engaging said female member end portion interior surface, said seal ring having a minimum inside diameter less than the minimum outside diameter of said male member end portion and a maximum inside diameter less than the maximum outside diameter of said male member end portion whereby when said seal ring is positioned on said male member end portion, the maximum inside diameter end of said seal ring is spaced apart from said male member flange and said minimum inside diameter end of said seal ring extends axially beyond the end of said male member, said minimum and maximum inside diameters of said seal ring being subject to manufacturing tolerances, said seal ring having an axial length between said lip and the minimum inside diameter end thereof at least equal to the depth of said end portion interior surface of said female member, and the maximum outside diameter of said seal ring outer surface adjacent said lip being greater than the maximum inside diameter of said female member end portion.

4,648,633
SOCKET JOINT

Bernhard Bergmann, Balsthal, Switzerland, assignor to Von Roll AG, Gerlafingen, Switzerland

Filed Aug. 28, 1985, Ser. No. 770,222
Claims priority, application Switzerland, Sep. 17, 1984, 4450/84
Int. Cl.[4] F16L *19/03*
U.S. Cl. 285—337 12 Claims

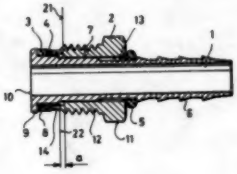


1. A socket joint for two pipeline elements, in which the spigot end of one pipeline element is inserted in the socket end of the other pipeline element and is sealed by an elastomeric gasket, which comprises a retaining ring mounted on the outer circumference of the spigot end of one pipeline element, said retaining ring having a socket-side end face, a thrust or shear preventing ring supported by said retaining ring circumscribing said spigot end and fixed to the socket end of the other pipeline element, an elastic thrust ring arranged between the socket-side end face of the retaining ring and the socket end, packing elements associated with the thrust preventing ring on both the side remote from and that facing the socket end, wherein the ring is positioned between said packing elements and within the thrust ring, and a closed corrosion protection zone between the retaining ring and socket end sealed by said packing elements and thrust ring.

4,648,634
HOSE CONNECTION

Heinz Kelch, Königsfeld, Fed. Rep. of Germany, assignor to Mannesmann Kienzle GmbH, Fed. Rep. of Germany

Filed Jun. 5, 1985, Ser. No. 741,632
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1984, 3421604
Int. Cl.[4] F16L *19/00*
U.S. Cl. 285—356 4 Claims



1. Hose connection for connecting a hose to a rigid duct body of a fluid unit, comprising an axially elongated hose sleeve having an axially extending outer surface, an axially extending inner surface, a first end arranged to be seated in

surface contact with the rigid duct body and a second end arranged to receive the hose, an axially extending hollow screw mounted on and encircling the outer surface of said hose sleeve, wherein the improvement comprises that the outer surface of said hose sleeve has a first axially extending cylindrical portion followed by a second axially extending cylindrical portion with said first cylindrical portion located closer to the first end of said hose sleeve, said first cylindrical portion having a larger diameter than said second cylindrical portion, a flange on the first end of said hose sleeve and extending between said first cylindrical portion and the first end and projecting radially outwardly from said first cylindrical portion with said flange forming an annular abutment surface facing said second end of said hose sleeve and extending radially outwardly from said first cylindrical portion, a sealing ring encircling said first cylindrical portion and arranged to bear against said abutment surface, said hollow screw having an inner surface and an outer surface extending in the axial direction thereof with the inner surface having a first axially extending cylindrical portion and a second axially extending cylindrical portion with the first cylindrical portion located closer to the first end of said hose sleeve than said second cylindrical portion, said first cylindrical portion of said hollow screw slides over said first cylindrical portion of said hose sleeve and said second cylindrical portion of said hollow screw is in sliding surface contact with said second cylindrical portion of said hose sleeve, the outer surface of said hollow screw is threaded for threaded engagement with the duct body, a first annular shoulder formed on said hose sleeve at the juncture of the first and second cylindrical portions thereof with said first annular shoulder extending radially outwardly from said second cylindrical portion to said first cylindrical portion of said hose sleeve, a second annular shoulder formed on said hollow screw at the juncture of the first and second cylindrical portions thereof with said second annular shoulder projecting radially outwardly from said second cylindrical portion to said first cylindrical portion of said hollow sleeve, said hollow sleeve having a first end and a second end with said first end forming the end of said first cylindrical portion of said hollow sleeve closer to said abutment surface on said flange, whereby said first annular shoulder forms a stop for said second annular shoulder as said hollow screw is threaded into the duct body and limits the pressing action as said first end of said hollow screw forces said sealing ring against said abutment surface on said flange.

4,648,635

BAYONET COUPLING FOR HOLLOW CYLINDRICAL MEMBERS

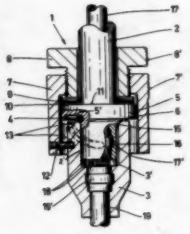
Dieter Jühling, Constance, Fed. Rep. of Germany, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Mar. 3, 1986, Ser. No. 835,452

Claims priority, application Switzerland, Mar. 6, 1985, 1007/85

Int. Cl.⁴ F16L *19/00*

U.S. Cl. 285—361 **6 Claims**



1. A bayonet coupling comprising

a pair of hollow cylindrical members, one of said members having an axial extension received in a corresponding axial recess in the other of said members, said other member having helical grooves in a periphery thereof, each said groove having a closed end extending at a right angle to a longitudinal axis of said other member;

a ring seal between said members;

a shoulder on one of said members;

an axially movable and rotatable connecting ring engaging said shoulder and having a plurality of radially inwardly projecting elements cooperating with said helical grooves in the other of said members to interconnect said members; and

clamping means engaging between said connecting ring and one of said members for moving said members having said shoulder towards said other member to compress said ring seal.

4,648,636

CONTAINER LOCKING

Kenneth Reynard, Thirsk, Great Britain, assignor to George Blair PLC, Newcastle upon Tyne, Great Britain

Filed Jul. 12, 1985, Ser. No. 754,640

Claims priority, application United Kingdom, Jul. 16, 1984, 8418000

Int. Cl.⁴ E05C *1/06, 9/12*

U.S. Cl. 292—39 **6 Claims**

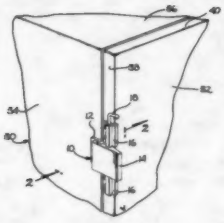
1. In a cargo container having at least one generally planar outer door, a locking mechanism for engagement with the surrounding door frame or the like to draw the door into a closed and sealed position therewith, the door having inner and outer faces defining its thickness and said mechanism being contained at least mainly within said thickness of the door, the locking mechanism comprising an inclined bolt having opposite faces that are inclined in the same direction away from the outer face of the door and that converge towards each other with increasing distance from said outer face in the form of an inclined wedge, guide means in the door for locating said bolt displaceably whereby the bolt is extendable from an edge of the door, a cooperating recess in the surrounding door frame receiving said extended bolt, said recess having opposite faces for engagement by said faces of the bolt, whereby one opposed pair of faces of the bolt and the recess are engaged with a wedging action as the bolt moves into the recess, thereby to urge the door into the fully closed and sealed position, and the remaining opposed pair of faces of the bolt and recess cooperate with a wedging action to break the seal between the door and its frame when the bolt is retracted from the recess.

4,648,637

REMOVABLE LATCH MECHANISM

Ernest J. Walter, 2913 Caldwell Ave., Ontario, Calif. 91761

Filed Oct. 3, 1984, Ser. No. 657,176
Int. Cl.[4] E05C *19/12*
U.S. Cl. 292—128 **2 Claims**



1. A latch mechanism comprising:

a. a pair of butt members for being mounted to the edge surface of a door each butt member having a cylindrical aperture defined longitudinally therethrough;

b. a removable rocker plate member having a cylindrical bore defined longitudinally therethrough, said rocker plate member including a lip protruding along the leading edge thereof, said lip having a first surface which forms substantially a right angle with the upper surface which forms substantially a right angle with the upper surface of said rocker plate member, and a second surface which slopes down and away from the upper terminus of said first surface;

an upper surface for receiving manual contact for opening and closing said latch mechanism, a lower surface having a ridge adjacent to said cylindrical bore between said bore and said lip, a first downwardly sloping surface extending from said ridge toward said lip, and a second downwardly sloping surface extending toward the outer edge of said rocker plate member;

c. a cylindrical pivot pin removably receivable through said cylindrical bores in said butt members and said rocker plate member, said pivot pin including a retaining means at at least one end thereof for retaining said pivot pin within said bores, such that said rocker plate is pivotal about said pivot pin, and said pivot pin is removable without the use of tools;

d. a strike member including an outwardly extending lip along the longitudinal axis thereof, said lip having a first surface which forms a substantially right angle with said strike, and a second surface that slopes down and away from the upper terminus of said first surface toward the leaning edge of said strike, such that the slope surface of said lip of said rocker plate and said strike slide over each other when said strike and said rocker plate member are brought into engagement so that said lips will latchedly engage to retain said latch mechanism in its closed position; and

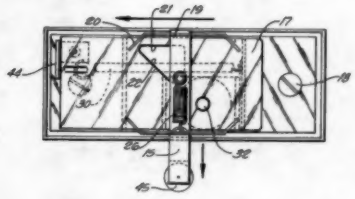
e. a removable sheet metal spring having a first leaf which abuts the edge surface of said door, a lip extending downwardly from the terminous of said first leaf such that said spring is urgently retained along the outer corner of said door edge surface, a second leaf opposing said first leaf and urgently abutting the lower surface of said rocker plate between the cylindrical bore and the outer terminious of said rocker plate, and a bulbous bend substantially bisecting said first and second leaves such that said bend rides over said ridge of said rocker plate and abuts the downwardly sloping surface of said rocker plate over said ridge, said pivot pin, said rocker plate and said spring being aligned such that said spring provides an urgent moment to continually urge said rocker plate into its normally closed position and providing only nominal compressive forces substantially perpendicular to said pivot pin such that said pivot pin is freely engageable and removable by hand, whereby said leaves are urged outwardly from said bend when said spring is in its unconstrained condition, and whereby said spring is securely retained between said rocker plate and said edge surface of said door in its constrained condition, and urges said rocker plate to pivot about said pivot pin toward its engaged position.

4,648,638

SLIDING DOOR LOCK ASSEMBLY

Roy S. McKnight, P.O. Box 116, Dundee, Fla. 33838

Filed Jun. 24, 1985, Ser. No. 747,834
Int. Cl.[4] E05C *1/08*
U.S. Cl. 292—144 **8 Claims**



1. A lock assembly for a closure mounted for sliding movement back and forth along a path from a closed position to an open position, comprising:

a lock housing mounted adjacent to the closure;

a bolt mounted on the housing for sliding movement between a first position retracted from the path of the closure and a second position where a portion of the bolt extends into the path of said closure;

a plate movably mounted on the housing and having therein a camming aperture providing a cam surface;

a pin secured to the bolt and extending through the aperture in the plate;

a first spring connected between the housing and the pin for urging the bolt toward the path of the closure to bring the pin into contact with the cam surface, said cam surface having a configuration such that movement of the plate in one direction allows the bolt to move toward the path of the closure and the movement of the plate in the other direction cams the bolt toward the retracted position;

a second spring connected between the housing and the plate for urging said plate in said other direction; and

reset means for moving said plate in said one direction to position the bolt in the path of movement of the door for locking.

4,648,639

APPARATUS AND METHOD FOR A SECURITY LOCK

Eugene W. Martin, Salt Lake City, and Robert J. Martin, Bountiful, both of Utah, assignors to Interwest Import & Export Company, North Salt Lake, Utah

Filed Jul. 3, 1985, Ser. No. 752,369
Int. Cl.[4] E05C *1/16*; E05B *55/10*
U.S. Cl. 292—167 **27 Claims**

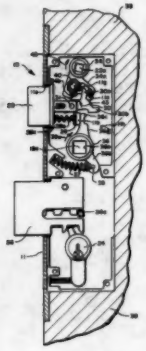
1. A security lock for selectively locking or unlocking a door, said security lock comprising:

latch means connected to door handles which are adapted to be located on the inside and outside of said door, said latch means comprising means for securing said door in a closed position;

security means for selectively locking and unlocking said latch means comprising a hand-actuated member adapted to be located on the inside of said door, said member being operable between locked and unlocked positions to selectively lock and unlock said latch means said security

means being disconnected from said door handles in the locked position and said security means further comprising means for disengaging said latch means from said door handles when said member is operated so as to lock said latch means thereby permitting free rotational displacement of said door handles; and

said latch means further comprising means for automatically



unlocking said security means when said latch means is moved to a fully retracted position causing said hand-actuated member to move from a position to an unlocked position;

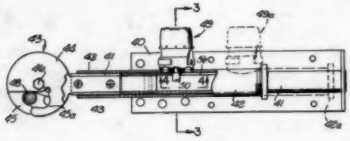
whereby when said security means is in a locked position and the door is subsequently closed, the security means is automatically unlocked thereby preventing accidental lock-out.

4,648,640

LOCKABLE SLIDING GATE LATCHING DEVICE

Joseph F. Giordano, 8028 Oleander, Fontana, Calif. 92355

Division of Ser. No. 508,009, Jun. 27, 1983, Pat. No. 4,536,022.
This application Jul. 15, 1985, Ser. No. 754,540
Int. Cl.[4] E05C *3/04*
U.S. Cl. 292—228 **4 Claims**



1. An elongated, lockable, latch device for a sliding gate associated with an opening in a fence or the like, said opening being bounded by a fixed structural member at one lateral edge thereof forming a closure interface with the corresponding edge of said sliding gate, said latch device being operable to effect latching of said gate at said interface, comprising:

a first generally tubular member mounted adjacent a first end thereof from a fixed location on said gate at least partially backset from said interface to project the second end of said first tubular member toward said interface;

a jaw assembly mounted on said first tubular member second end and a pin associated with said fixed structural member, said jaw assembly including a first jaw member having a mouth open toward said pin when said gate is open;

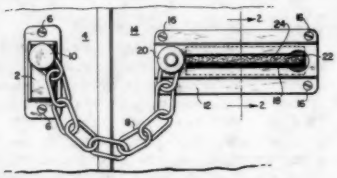
latching means including a second jaw member rotatably attached to said first jaw member, said second jaw member including a tongue projecting downward at an angle with respect to the centerline of said first tubular member when said jaw assembly is open, said second jaw member including a portion responsive to pressure from said pin as said gate is translated to closure at said interface to rotate said second jaw member to grip and capture said pin and contemporaneously rotate said tongue to project parallel to said first turbular member centerline; and including a second tubular member having an inside cross-section larger than the outside cross-section of said first tubular member, said second tubular member being slideably placed over said first tubular member to slide over said tongue when said gate is closed, thereby to prevent opening of said jaw assembly.

4,648,641

SAFETY DEVICE

John K. Foster, Harwichport, Mass., assignor to Packaging Industries Group, Inc., Hyannis, Mass.

Filed Nov. 16, 1984, Ser. No. 672,481
Int. Cl.[4] E05B *17/36*
U.S. Cl. 292—264 **2 Claims**



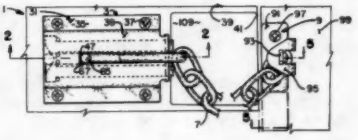
1. In a door chain lock of the type having a chain with a first part attached to a door frame and a second part, and a channel means having an elongate slot for receiving said second part, the improvement comprising blocking means in said slot wherein when said second part is at one end of said slot said blocking means prevents movement of said second part along said slot, and wherein said blocking means comprises a removable element having a length approximately equal to the distance between said second part and a second end of said slot when said second part is at said one end, and wherein said blocking means further comprises a base portion and an outwardly-extending portion tapered away from said base portion in transverse cross-section, said base and tapered portions extending along substantially the entire said length.

4,648,642

SECURITY CHAIN LOCK FOR DOORS

John J. Berich, 7518 Forest View Dr., St. Louis, Mo. 63121

Filed Apr. 15, 1985, Ser. No. 723,075
Int. Cl.[4] E05C *17/36*
U.S. Cl. 292—264 **17 Claims**



1. In a security chain lock comprising a first keeper element adapted to be secured near a free vertical edge of a door, a second keeper element adapted to be secured to a door frame adjacent said first keeper element, and a chain, normally attached to and extending between said first keeper element and said second keeper element and being removably attached to at least one of said first keeper element and said second keeper element, said chain having a length sufficient to be normally slack, the improvement wherein said first keeper element includes a horizontal spring chamber, a u-shaped slider part slidably mounted in said spring chamber and operatively con-

nected to said chain, said slider part including a pair of horizontal legs extending through an end wall of said spring chamber, and spring means for absorbing shock loads applied to said first and second keeper elements when said chain is pulled taut, said spring means comprising at least one coil compression spring mounted in said spring chamber for compression by said slider part.

4,648,643

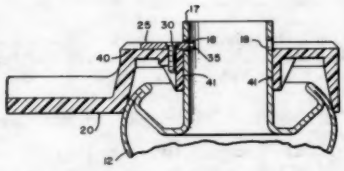
RETROFIT LEVER ASSEMBLY FOR A DOOR KNOB

Richard R. Bettger, San Francisco, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Continuation of Ser. No. 593,380, Mar. 26, 1984, abandoned. This application Apr. 21, 1986, Ser. No. 857,509

Int. Cl.[4] E05B *1/00*

U.S. Cl. 292—347 **5 Claims**



1. A retrofit lever assembly for a door knob, having an integral door knob shank, comprising:

a lever;

said lever having (a) a body portion with a substantially planar surface, and (b) an arm portion extending outwardly, from said body portion, generally parallel with said surface;

said body portion having (a) a circular aperture formed substantially centrally therethrough, in which to accommodate a door knob shank, and (b) a relief formed therein, opening onto, and at one side of, said aperture;

retaining means disposed in said relief for removable fastening thereof to said body portion and for coacting with said door knob shank to effect retention of said lever assembly on said door knob shank;

said body portion having an outermost, circumferential wall which extends substantially normal to said surface;

said wall having an annular edge coacting with said door knob to form a stabilizing means; and

said arm portion is integral with, and extends from, a sector of said edge.

4,648,644

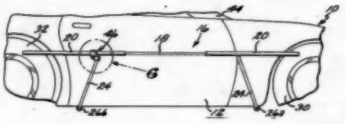
AUTOMOBILE PROTECTION DEVICE

Mark E. Swanson, 22790 Lapaix, Grand Terrace, Calif. 92324, and Glen E. Swanson, 1164 Cannon Rd., Riverside, Calif. 92506

Filed Jul. 22, 1985, Ser. No. 757,644

Int. Cl.[4] B60R *19/38, 19/42*

U.S. Cl. 293—118 **23 Claims**



1. A protective device for a motor vehicle having a body, said device comprising:

an elongate guard member having a longitudinal axis oriented substantially parallel to the longitudinal axis of said vehicle, said guard member being length-variable along said axis between a contracted position and an extended position; and

pivot means, having a first member operatively connected to the underside of said vehicle and a second member pivotally connected to said guard member, for movably mounting said guard member to said vehicle for movement between a lower position and an upper position along the side of said vehicle, whereby said guard member is lengthened by said pivot means along said axis from said contracted position to said extended position when said guard member is raised from said lower position to said upper position, and whereby said guard member is shortened by said pivot means along said axis from said extended position to said contracted position when said guard member is lowered from said upper position to said lower position.

4,648,645

AUTOMATIC CONTAINER SPREADER

Sven-Olov Lundgren, 20 Dixon St., Royal Park, South Australia, Australia 5014

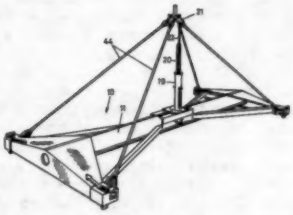
PCT No. PCT/AU84/00142, § 371 Date Mar. 22, 1985, § 102(e) Date Mar. 22, 1985, PCT Pub. No. WO85/00578, PCT Pub. Date Feb. 14, 1985

PCT Filed Jul. 20, 1984, Ser. No. 729,796

Claims priority, application Australia, Jul. 21, 1983, PG0398

Int. Cl.[4] B66C *1/66*

U.S. Cl. 294—81.53 **8 Claims**



1. A spreader for transmitting a lifting force to twist lock blocks located at respective corners of a container when engaged by respective twist locks carried by the frame of the spreader, wherein each said twist lock comprises a twist lock spindle having an arm projecting therefrom, comprising:

a longitudinal frame member and a pair of transverse frame members at respective ends of the longitudinal frame member, said twist locks being at respective ends of the transverse frame members,

a lifting member, lifting cables extending from the lifting member to the spreader frame, an indexing head on the spreader frame, spring means between the indexing head and the lifting member, a pair of bell cranks one at each respective end of said longitudinal frame member, link bar means coupled to said indexing head and to said bell cranks, and twist lock actuating bars carried by respective transverse frame member connecting each said bell crank to both said twist lock arms on a respective said transverse frame member, so arranged that rotation of the indexing head moves the link bars longitudinally and the actuating bars transversely to effect said simultaneous rotation of the twist locks,

and inhibit means operable between each respective said twist lock and the frame arranged such that if any one of the twist locks does not rotate to a locking position upon said lifting force being applied, the inhibit means inhibits movement of the coupling means which in turn disables the indexing head from rotation and thereby all other twist locks are prevented from rotation.

4,648,646

DEVICE FOR GRIPPING AND PLACING MEMBERS

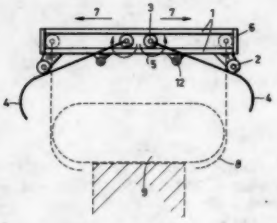
Olaf Klüpfel, Eickhorst; Walter S. Frielinghaus, Bockum, and Erhard Scholz, Drensteinfurt, all of Fed. Rep. of Germany, assignors to Müllers Maschinenfabrik GmbH

Filed Oct. 31, 1985, Ser. No. 793,650

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1984, 3440954

Int. Cl.[4] B66C *1/66, 1/06*

U.S. Cl. 294—106 **11 Claims**



1. Device for gripping, lifting and releasing a member such as a package or individual article and used in automatic handling apparatus, comprising at least a pair of gripping arms each having a first end and a second end, said gripping arms being pivotally displaceable, means engageable with said gripping arms and arranged for moving the second ends thereof into and out of gripping relation with a member, wherein the improvement comprises that the seconds ends of said gripping arms are arranged to grip the underside of the member to be lifted, said means are arranged to support the first ends of said gripping arms for movement generally horizontally and during such generally horizontal movement for displacing said gripping arms between a gripping position where said gripping arms depending generally vertically from the first end thereof and a released or open position where said gripping arms extend obliquely relative to the vertical and out of engagement with the member each said gripping arm has a pivot axis at the first end thereof, and said means are arranged to move said gripping arms between the gripping and released positions by pivoting the first ends of said arms about the pivot axis thereof and at the same time for moving the first ends of said gripping arms away from or toward one another so that the second ends of said gripping arms move into or out of gripping engagement with the member.

4,648,647

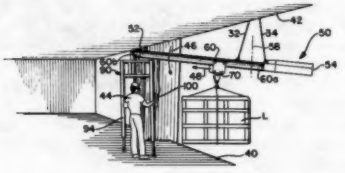
LOAD HANDLING APPARATUS

Charles W. Patton, 2881 Canton Rd., Uniontown, Ohio 44685

Filed Jun. 15, 1983, Ser. No. 504,505

Int. Cl.[4] B66C *1/00, 23/26, 23/78, 7/00*

U.S. Cl. 294—67.1 **4 Claims**



1. Apparatus for use with a high-lift crane hoist to carry, position, and deposit a load comprising in combination:

a long beam having designated forward and rearward ends and comprising a vertical center rib interconnecting top and bottom orthogonal flanges and a pair of eye flanges mounted in spaced relationship along the top to provide connection to the crane hoist such that the beam may be carried aloft by the crane in a substantially horizontal attitutde;

a load carrying trolley mounted on and movable along the bottom flange of the beam from a rearward load carrying position to a forward load depositing position, the rearward load carrying position being in axial alignment with a line passing through the center of gravity of the apparatus and through the center of lift of the crane hoist, said trolley including a double sheeved mechanism for raising and lowering the load carried by the trolley;

a power drive system to move the trolley along the beam including a battery power pack, an electric D.C. motor, a hydraulic pump, and hydraulic switching means mounted in a housing at the rearward end of the beam, and a long drive chain having its ends affixed to the trolley, said chain passing around a drive sprocket at the rearward end and driven by a hydraulic drive interconnected to the hydraulic pump through the switching means;

leg stand means mounted at the forward end of the beam and adapted to be hydraulically rotated to a downwardly position to support the end of the beam when the trolley is moved forwardly off the center of gravity rearward position;

a hydraulically operated actuator mounted at the rearward end of the beam and associated with the double sheeved mechanism through a cable which effects raising and lowering of the load in response to the switching means and irrespective of the position of the trolley along the beam; and

a control means positioned at the forward end of the beam and electrically interconnecting the battery power pack, the D.C. motor, and the hydraulic switching means in a circuit for selectively controlling the hydraulic operation of the trolley, the leg stand means, the actuator for raising and lowering the load, preventing movement of said trolley except where said leg is in a predetermined position, preventing raising of said leg except when said trolley is in a predetermined position and preventing lowering of a load except when the trolley is in a predetermined position.

4,648,648

REMOVABLY PIVOTED REAR PARCEL SHELF FOR HATCHBACK TYPE VEHICLE

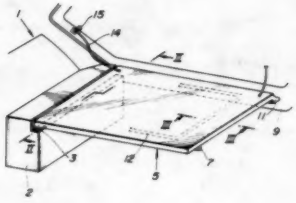
Masaaki Shigesada, Hadano, and Norio Kazama, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 16, 1985, Ser. No. 809,403

Claims priority, application Japan, Jan. 18, 1985, 60-7110

Int. Cl.[4] B60R *3/08*

U.S. Cl. 296—37.16 **7 Claims**



1. A vehicle comprising:

a vehicle body having at least one support portion,

a back door pivotally mounted on said vehicle body,

a board serving as a rear parcel shelf when said board is placed in a fixed position, said board having front and rear ends, said rear end being clamped between said support

portion of said vehicle body and said back door when said board is in said fixed position and at the same time said back door is closed, and

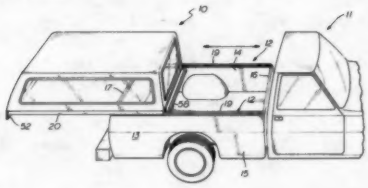
pivot means for connecting said front end of said board with said vehicle body and permitting said board to swing about a pivot axis extending laterally of said vehicle body from said fixed position to an open position in which said rear end of said board is lifted up, said pivot means permitting said front end of said board to be disconnected from said vehicle body, wherein said rear end abuts against said support portion in such a manner as to limit said board from moving forwardly of said vehicle body when said board is in said fixed position, and wherein said vehicle body comprises a rear right side interior member and a rear left side interior member which are fixed to said vehicle body, each of said right and left interior members having a rear end which is formed with said support portion, and said pivot means comprises right pivot means for connecting said front end of said board to said right interior member and left pivot means for connecting said front end of said board to said left interior member.

4,648,649

CAMPER-TRUCK ASSEMBLY AND MOUNTING HARDWARE

James L. Beal, 4010 Acorn La., Porter, Tex. 77365

Filed May 30, 1985, Ser. No. 739,605
Int. Cl.[4] B60P *3/42*
U.S. Cl. 296—156 **8 Claims**



1. A system for securing a camper top on a truck body comprising;

a first set of mounting rail members secured to the top surface of the truck bed side walls having means for slidably receiving and engaging a second set of mounting rail members,

said second set of mounting rail members secured to the undersurface of said camper top along the sides thereof, having means for slidably receiving and engaging said first set of mounting rail members,

said receiving and engaging means of said mounting rail members comprises a longitudinally extending dove tail rib on one rail member and a longitudinally extending dove tail slot on the other rail member slidably receiving said rib,

a set of side seal members disposed between said top surface of the truck bed side walls and said first mounting rail members,

a front seal member secured to the front wall of said camper top for sealing engagement with the top surface of the truck bed front wall,

said front seal member comprising an elongated inverted U-shaped channel having a longitudinal extending resilient seal, the upper portion of which is secured within the U-shaped channel and the lower portion of which depends outwardly therefrom and adapted to sealingly engage the front wall of the truck bed,

said front seal member having a height sufficient to fill the space between the truck bed and the underside of said camper top when said first and second mounting rail members are engaged,

a rear seal member secured to the rear wall of said camper top for sealing engagement with the truck bed tailgate,

said rear seal member comprising an elongated inverted U-shaped channel having a longitudinally extending resilient seal, the upper portion of which is secured within the U-shaped channel and the lower portion of which depends outwardly therefrom and adapted to sealingly engage the tailgate of the truck bed,

said rear seal member having a height sufficient to fill the space between the truck bed and the underside of said camper top when said first and second mounting rail members are engaged, and

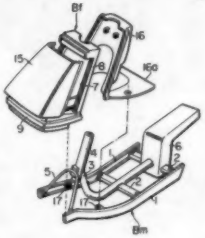
locking means interconnecting said first and second mounting rail members comprising a plurality of cam fasteners operatively connected between said first and second mounting rail members to releasably bias same together against relative movement therebetween.

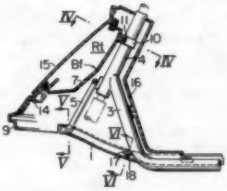
4,648,650

BODY FOR TWO-WHEELED OR THREE-WHEELED VEHICLE

Takayuki Fujii, Ooi, and Masayoshi Baba, Urawa, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Shibuya, Japan

Continuation of Ser. No. 454,654, Dec. 30, 1982, abandoned.
This application Jun. 11, 1985, Ser. No. 743,282
Claims priority, application Japan, Jan. 7, 1982, 57-1130
Int. Cl.[4] B62D *25/00*; B62J *7/04, 17/06*; B60R *19/02*
U.S. Cl. 296—203 **7 Claims**





1. A body for a vehicle having less than four wheels with one of the wheels being a front wheel, comprising:

a main body formed of a framework of metal material; and

a front body having a recessed panel, an edge frame portion of an inverted vertical U shape with a laterally extending upper edge, and a protruding front side portion serving as a front bumper extending horizontally and of U shape in cross section in plan view with a rear side thereof open, said front side portion being disposed forwardly of the front wheel at a front portion of said main body and being integrally formed with said panel and said edge frame portion;

said front body being entirely formed of synthetic resin material and being integrally connected at lowermost rearward lateral portions thereof to said main body, said front body being further connected to said main body at a portion of said panel adjacent said upper edge of the edge frame portion,

said front body providing a space forwardly of said panel, said space being closed by a cover attached to said front body to define a trunk room therein.

4,648,651

COLLAPSIBLE SUPPORT WITH ARMRESTS

Peter C. Hawkes, Rugby, England, assignor to Andrews Maclaren Limited, Northampton, England

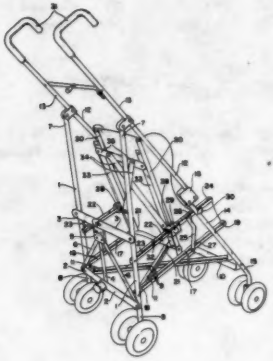
PCT No. PCT/GB84/00385, § 371 Date Jun. 12, 1985, § 102(e) Date Jun. 12, 1985, PCT Pub. No. WO85/02154, PCT Pub. Date May 23, 1985

PCT Filed Nov. 9, 1984, Ser. No. 744,553

Claims priority, application United Kingdom, Nov. 10, 1983, 8329954

Int. Cl.[4] B62B 7/08; A47C 1/027

U.S. Cl. 297—45 9 Claims



1. A collapsible support, for example a collapsible baby carriage, comprising:

a rear frame having two upper corners and two lower corners;

a base frame having two front corners and two rear corners pivotally connected, respectively, to the two lower corners of the rear frame;

two upper brace members respectively pivoted, at their upper ends to the upper corners of the rear frame;

two lower brace members respectively pivoted, at their lower ends, to the front corners of the base frame;

two knuckle joints respectively connecting the two upper brace members to the two lower brace members so as to prevent folding of the rear frame towards the base frame when the support is extended with the upper brace members having a longitudinal axis extending substantially parallel with the lower brace members, but which allow the upper and lower brace members to fold, respectively, towards the rear corners of the base frame;

two seat support members having rear ends pivotally supported, respectively, at or adjacent the rear corners of the base frame and having front ends respectively supported by the two lower brace members;

two backrest members having lower ends respectively pivoted to the seat support members;

two armrest members having rear ends pivotally connected to the rear frame at positions respectively above the rear ends of the two seat support members and having front ends which project beyond the lower brace members when the support is extended;

two links having upper and lower ends respectively pivoted to the armrest members and the seat support members;

two connector members respectively slidable on the backrest members and respectively slidable on the armrest members so as to allow adjustment of the inclination of the backrest members when the support is extended; and

locking means for locking the connector members, on the respective armrests, so as to support the backrest members in at least one position.

4,648,652

COLLAPSIBLE PICNIC TABLE

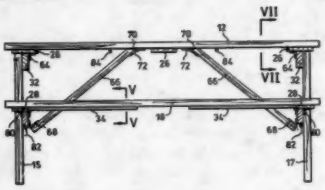
Gerald B. Van Kuren, R.R. No. 2, Dunville, Ontario, Canada (N1A 2W2)

Filed Jun. 23, 1986, Ser. No. 877,180

Claims priority, application Canada, Jul. 31, 1985, 487862

Int. Cl.[4] A47B 39/00

U.S. Cl. 297—159 10 Claims



1. A folding table comprising a table top, two pairs of legs with each pair located adjacent a respective end of said top and pivotally connected thereto, a transverse bar carried by each pair of legs, seats at each side of said table supported on the transverse bars, said seats having tracks extending longitudinally along the bottom of the seats, slide members mounted in said tracks, each pivotally connecting a respective end of a transverse bar to its respective track, and means for selectively maintaining each pair of legs in a standing position when the table is unfolded.

4,648,653

STACKABLE ARMCHAIR

David L. Rowland, 315 E. 91st St., New York, N.Y. 10128

Filed May 30, 1986, Ser. No. 869,190

Int. Cl.[4] A47C 3/04

U.S. Cl. 297—239 8 Claims

1. A stacking armchair including in combination:

a front frame having two bottom rail portions, two front leg portions, two seat side rail portions, a rear connecting member connecting together the rear ends of the side rail portions and extending therebeyond to the outboard ends, and a front brace portion bridging between the front leg portions, said front frame being made from thin rod stock, the rear of each bottom rail portion having a turned-up generally vertical terminal portion,

two rear leg members of rod stock that is larger in diameter and greater in strength and stiffness than the rod stock from which the front frame is made, said rear leg member having a lower end welded to the said terminal portion, said rear leg portion being welded also to said outboard ends of the rear connecting member and having an upper portion extending thereabove,

a seat secured to and supported by said front frame,

a back secured to and bridging across the upper portion of said rear leg members,

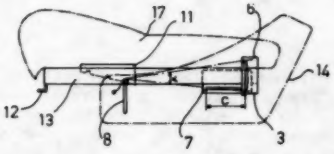
said upper portions of said rear leg members each being shaped to provide a short outwardly extending generally horizontal portion, a forwardly extending arm-support portion parallel to the seat-supporting side rail portion but outboard from it, and

a chair arm supported by said arm-support portion.

4,648,654
ADJUSTABLE VEHICLE SEAT

Hans W. Voss, Rua Tome Portes, 554, 01000 Sao Paulo SP, Brazil

Filed Feb. 21, 1984, Ser. No. 581,846
Int. Cl.[4] A47C 1/023; B60N 1/02
U.S. Cl. 297—313 26 Claims

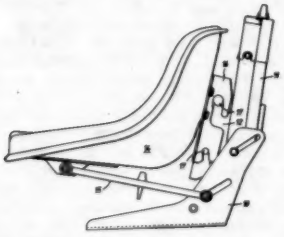


1. An adjustable vehicle seat having a back portion and a seat portion, comprising a first manually operable adjusting means simultaneously and obligatorily providing both longitudinal movement of the seat portion relative to the back portion and a limited angular movement of the seat portion in relation to a first transverse axis of rotation, said first adjusting means being operable to produce said limited angular movement in response to said longitudinal movement of the seat portion, the angle between the seat portion and the back portion decreasing or increasing in response to longitudinal movement of the seat portion with respect to the back portion, and a second adjusting means which is manually rotatable, said second adjusting means providing, in response to manual rotation thereof, a limited angular movement of the seat portion about a second axis of rotation transverse to the seat portion, said second adjusting means being operable when the first adjusting means maintains the seat portion in a plurality of longitudinal positions.

4,648,655
VEHICLE SEATS

David Moorhouse, Towcester, England, assignor to jmh Holdings Limited, Northampton, England

Filed Sep. 18, 1985, Ser. No. 777,318
Claims priority, application United Kingdom, Sep. 28, 1984, 8424609
Int. Cl.[4] B60N 1/08
U.S. Cl. 297—331 4 Claims

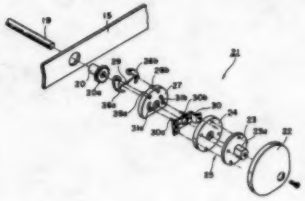


1. A vehicle seat comprising a support member upstanding from a base, a carriage mounted on the support member and including coupling members, a seat means, a pivot arm device pivotally connected to the seat means and to the base, a hooked coupling device secured to the back of the seat means and detachably engaging the coupling members on the carriage whereby the seat means may be detached from the carriage and pivoted at the base, and a latch operatively associated between the seat means and the carriage, said latch being movable between a locked and released position, whereby the latch in its locked position prevents accidental release of the hooked coupling device from the carriage and in its released position enables the seat means to be detached from the carriage.

4,648,656
CAR SEAT

Syuzaburo Kimura, Yokohama, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Continuation of Ser. No. 627,888, Jul. 5, 1984, abandoned. This application Aug. 21, 1986, Ser. No. 898,881
Claims priority, application Japan, Jul. 13, 1983, 58-108730[U]
Int. Cl.[4] B60N 1/023
U.S. Cl. 297—337 7 Claims



1. An adjusting mechanism for a car seat having a seat cushion supported in such a manner as to allow its independent movement and adjustment towards and away from the backrest of the seat, said car seat adjustng mechanism comprising, in combination:

a pair of left and right supports installed, one each, on the upper rails of a pair of left and right seat slide adjusters which support the entire seat with the backrest in such a way that the entire seat can be moved forward and backward;

a pair of left and right side frames mounted on said pair of left and right supports;

a pair of mobile frames supported by said side frames so as to allow said mobile frames to slide freely forward and backward;

the seat cushion being installed on said mobile frames independently of the backrest;

a rack contained in one of said pair of frames;

a shaft with a pinion whose cogs engage with said rack being rotationally mounted in the other of said pair of frames, said pinion being arranged to move one pair of frames relative to the other pair of frames for adjustment of the seat cushion when said shaft is rotated;

a lock mechanism including a knob on one end of said shaft and rotatable about the axis of said shaft;

the lock mechanism being actuated by rotational movement of said knob to selectively restrict the rotation of said pinion and the location of the seat cushion;

the lock mechanism including means to release said lock mechanism during initial rotation of the knob and thereafter upon continued rotation of the knob, to rotate said shaft and adjust the relative position of said pairs of frames and consequently said seat cushion.

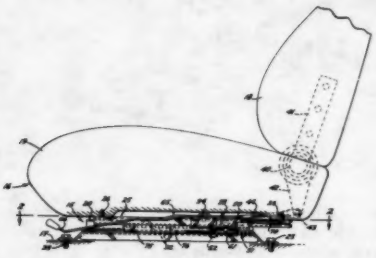
4,648,657
SEAT ADJUSTER RESPONSIVE TO TILTING OF SEAT BACK

David C. Cox, Jackson, Mich., and Thomas O. Marx, Rockton, Ill., assignors to Atwood Vacuum Machine Company, Rockford, Ill.

Filed Jul. 2, 1985, Ser. No. 751,600
Int. Cl.[4] B60N 1/04
U.S. Cl. 297—341 8 Claims

1. Mechanism for mounting a vehicle seat for fore-and-aft adjustment to different selected functional positions on a vehicle floor and for enabling the seat to move forwardly to an entry position in response to forward tilting of the seat back, said mechanism comprising an elongated support member mountable in a fixed position on the vehicle floor and formed with a fore-and-aft extending row of openings, an elongated track member attachable to the seat and mounted to slide back

and forth on said support member, coacting means on said members and normally engaging one another to hold said seat in a selected functional position, manually operable means for releasing said coacting means to enable the functional position of said seat to be adjusted, means responsive to forward tilting of said seat back for releasing said coacting means to enable said seat to move forwardly to said entry position, a positive stop extending laterally outwardly of and normally held in a fixed fore-and-aft position on said support member, means extending laterally outwardly from said track member and engageable with said stop to limit rearward movement of said



seat when the latter is returned rearwardly from said entry position, said stop forming part of a lever having a lug adapted to swing into and out of a selected one of said openings, means mounting said lever on said support member both to swing about an upright axis on said support member and to move back and forth along said support member and means for causing adjustment of the fore-and-aft position of said stop on said support member when the functional position of said seat is adjusted while leaving the stop in a fixed fore-and-aft position on said support member when said seat is shifted forwardly to said entry position.

4,648,658

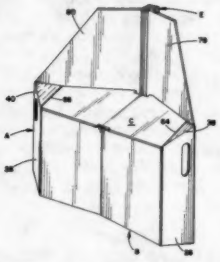
COLLAPSIBLE CHAIR

Wayne Calco, 91 Bard Dr., Hudson, Ohio 44236

Filed May 14, 1985, Ser. No. 733,753

Int. Cl.[4] A47C *4/00*

U.S. Cl. 297—440 **34 Claims**



1. A foldable article of furniture made of stiff sheet material, comprising:

a plurality of base panels connected at their lateral edges to form a base portion;

a seat panel which is integral with and hinged from at least one of said base panels along a pair of spaced hinge-like sections each of which is defined by a pair of hinge lines, a first hinge line extending between said seat panel and said hinge-like section and a second hinge line extending between said at least one base panel and said hinge-like section, said seat panel being disposed in a substantially horizontal orientation over said base portion while in use and being pivotable around said hinge-like sections to a substantially vertical orientation when the article of furniture is to be folded;

a spine portion provided between two of said base panels for reinforcing the article of furniture and including a pair of flanges which are secured to each other, said flanges being, respectively, integral with one of said base panels and being secured to each other in an overlying relationship; and,

a reinforcing member disposed within said base portion and secured to said spine portion for reinforcing said seat panel.

4,648,659

METHOD AND HYDRAULIC SYSTEM FOR CONTROLLING SUPPLY OF FLUID TO COMBINE FOR EXTRACTING MINERALS

Felix Z. Masovich, and Vladimir V. Starichnev, both of Moscow, U.S.S.R., assignors to Gosudarstvenny Proektno-Konstruktorsky I Experimentalny Institut Ugolnogo Mashinostroenia "Giprouglemash" , Moscow, U.S.S.R.

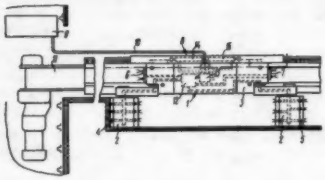
PCT No. PCT/SU83/00011, § 371 Date Aug. 21, 1984, § 102(e) Date Aug. 21, 1984, PCT Pub. No. WO84/02739, PCT Pub. Date Jul. 19, 1984

PCT Filed May 27, 1983, Ser. No. 648,154

Claims priority, application U.S.S.R., Jan. 11, 1983, 3528701

Int. Cl.[4] E21C *27/36, 35/22;* E21F *5/02*

U.S. Cl. 299—1 **8 Claims**



1. A method of controlling the supply of fluid to a combine for extracting minerals, comprising the steps of alternately feeding fluid to hydraulic cylinders (14, 15) of a drive (8) for moving the combine along the face for alternately actuating them; and feeding the fluid from the hydraulic cylinders (14, 15) to a dust suppression hydraulic system (1), said dust suppression hydraulic system receiving the fluid at a pre-set pressure after actuation of said hydraulic cylinders (14, 15) for emergence under flowthrough conditions.

5. A hydraulic system of a combine for extracting minerals, comprising a housing; hydraulic dust suppression means on said housing; hydraulic drive means for driving said housing and moving the combine along the face, said hydraulic drive means including hydraulic cylinders which are alternately actuated; and hydraulic distribution means for feeding fluid from said hydraulic cylinders to said hydraulic dust suppression means, whereby an open-circuit hydraulic system is formed in which the fluid used for said dust suppression means is the same fluid used by and discharged from said hydraulic cylinders, wherein said dust suppression hydraulic means comprises a flow regulator adapted to maintain a pre-set pressure in said dust suppression hyudraulic means at varying fluid flow rates which vary as a function of the speed of the combine movement along the face.

4,648,660

METHOD AND APPARATUS FOR MINING MACHINE CUTTER HEAD

John P. Mann, Worthington; Victor M. Levenstein, Reynoldsburg, and Charles H. Fox, Greenville, all of Ohio, assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 26, 1985, Ser. No. 727,682

Int. Cl.[4] E21C *27/24*

U.S. Cl. 299—10 **14 Claims**

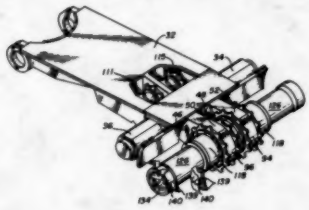
1. In a continuous mining machine having a frame assembly pivotally attached to said machine and a rotary cutting head mounted on a shaft on the forward end of said frame assembly and having cutting bits thereon for cutting loose mining mate-

rial from the face of a mine and extending beyond each side of said frame assembly, the improvement comprising:

a. at least one bearing mounted on said cutting head shaft for enabling rotation of said shaft,

b. at least one C-shaped bearing support housing on the forward end of said frame assembly for receiving said bearing on said shaft,

c. a matching removable C-shaped bearing support end cap



for attachment to said frame assembly C-shaped bearing support housing for encompassing and supporting said shaft bearing for rotation of said shaft whereby said shaft may be removed from said mining machine without lateral movement of said shaft by removing said matching removable C-shaped bearing support housing, and

d. drive means coupled to said cutting head shaft to provide rotary motion thereto for cutting mining material.

4,648,661

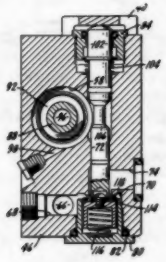
EMPTY AND LOAD VALVE FOR A RAILROAD CAR BRAKE SYSTEM

Eugene W. Schmitt, Lockport, and Robert E. Campbell, Arlington Heights, both of Ill., assignors to Sloan Valve Company, Franklin Park, Ill.

Filed Jun. 17, 1985, Ser. No. 745,784

Int. Cl.⁴ B60T 8/20

U.S. Cl. 303—23 R **4 Claims**



1. An empty and load valve for a railroad car brake system that includes a control valve and an air actuating means comprising a valve body, an equalizing reservoir connected to the body, an air inlet in the body adapted to be connected to the control valve and an air outlet adapted to be connected to the air actuating means, a first air passage between said inlet and outlet, a piston assembly reciprocal in said first air passage to alternately open and close said first air passage and thereby proportion the air from the control valve to the air actuating means,

a sending arm attached to the valve body, a plunger movable in the valve body in response to the sensing arm and positioned for contact with said piston assembly to prevent movement thereof to close said first air passage during car loaded conditions,

a second air passage in said body extending between said first air passage and said reservoir, normally closed valve means in said second air passage, said plunger being positioned to open said normally closed valve means during other than loaded car conditions to connect said reservoir with said air inlet.

4,648,662

CIRCUIT CONFIGURATION FOR A SLIP-CONTROLLED VEHICLE BRAKE SYSTEM

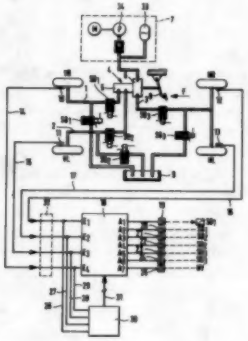
Helmut Fennel, Bad Soden, and Hans Wupper, Friedrichsdorf, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt, Fed. Rep. of Germany

Filed May 8, 1985, Ser. No. 732,342

Claims priority, application Fed. Rep. of Germany, May 9, 1984, 3417019

Int. Cl.⁴ B60T 8/02

U.S. Cl. 303—92 **3 Claims**



1. A circuit configuration for a slip-controlled vehicle brake system which is equipped with sensors for the determination of the rotational behavior of the front and the rear wheels, with electronic circuits for the processing, logic combining and monitoring of the sensor signals and for the generation of control signals, which control signals allow control the braking pressure variation individually at the wheels according to predetermined selection criteria, wherein upon interference of the sensor signals of at least one of the wheels (VR, VL, HR, HL), the braking pressure control of this wheel is switched over the being responsive to the rotational behavior of another wheel according to a predetermined selection criterion, wherein upon interference of the sensor signals of a front wheel (VR or VL), the braking pressure control of this wheel is switched over to being responsive to the rotational behavior of the second front wheel (VR or VL), while upon interference of the sensor signal of a rear wheel (HR, HL) the braking pressure control of this wheel can be switched over to being responsive to the rotational behavior of the front wheel (VR, VL) on the same side.

2. A circuit configuration as claimed in claim 1, wherein the switching-over is limited to the duration of the signal interference.

4,648,663

WHEEL SLIP CONTROLLING SYSTEM

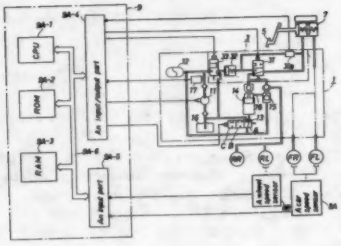
Yoshihisa Nomura; Masakazu Ishikawa, both of Toyota; Akira Shirai, Toyoake; Takahiro Nogami, Toyota; Kazumasa Nakamura, and Kaoru Ohashi, both of Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 11, 1985, Ser. No. 775,007

Claims priority, application Japan, Sep. 28, 1984, 59-205265; May 8, 1985, 60-68437[U]

Int. Cl.[4] B60T 8/40; B60L 3/10

U.S. Cl. 303—106 4 Claims



1. A wheel slip controlling device, comprising:

(a) braking means operable by a driver of a car for braking rotation of wheels at least including driving wheels, wherein said braking means includes a brake pedal adapted to be actuated by operation of the driver of the car, and a master cylinder for providing a pressure corresponding to an extent of actuation of said brake pedal to an antiskid controlling means;

(b) slip detecting means for detecting a slipping condition of said wheels to output a slip signal indicative of the slipping condition, wherein said slip detecting means includes a first sensor for detecting the speed of said driving wheels, and a second sensor for detecting the speed of the car;

(c) traction controlling means responsive to said slip signal, said antiskid controlling means receiving signals from said traction controlling means, for controlling the pressure to be imparted from said braking means by way of a self-contained hydraulic pressure source means to control braking slip of said wheels at least including said driving wheels, wherein said antiskid controlling means includes

(1) said hydraulic source means for storing, actuating and accumulating hydraulic pressure,

(2) a magnet change-over valve connected to said hydraulic source means and being actuated by said traction controlling means to change over to three positions wherein it increases the hydraulic pressure at an A port thereof, it holds the hydraulic pressure at a B port thereof, and it reduces the hydraulic pressure at a C port to adjust the braking force,

(3) a valve regulating a hydraulic pressure either from said hydraulic source means or said braking means and said valve being controllable by oil pressure from said magnet change-over valve, and

(4) a change-over device including a change-over valve adapted to be changed over in response to a signal from said traction controlling means, and a pressure change-over valve for receiving the hydraulic pressure from said change-over valve via a cylinder and the hydraulic pressure from said master cylinder said pressure change-over valve being responsive to the traction controlling means to output the greater of the hydraulic pressures to said valve.

4,648,664

HYDRAULIC ANTI-SKID BRAKING SYSTEMS FOR VEHICLES

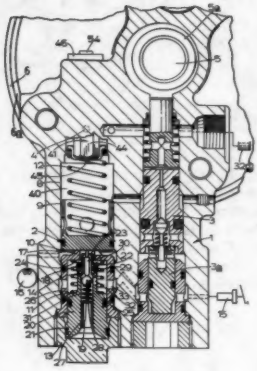
Alfred Yardley, West Midlands, England, assignor to Lucas Industries Public Limited Company, United Kingdom

Filed Mar. 1, 1985, Ser. No. 707,438

Claims priority, application United Kingdom, Mar. 7, 1984, 8405903; Jul. 2, 1984, 8416800

Int. Cl.[4] B60T 8/42; F16K 1/00

U.S. Cl. 303—115 11 Claims



1. A hydraulic anti-skid braking system for vehicles comprising a vehicle brake, a supply for operating fluid for applying said brake, skid sensing means for sensing the pressure of skid conditions at said wheel during braking and thereupon to produce skid signals, a modulator assembly for modulating the supply of fluid from said supply to said brake in accordance with said skid signals, and a hydraulic pump for controlling brake re-application following correction of said skid, said pump incorporating at least one plunger and a working chamber associated with said plunger and in communication with said modulator assembly, wherein said modulator assembly comprises a housing having a bore, a de-boost piston working in said bore and movable between an advanced inoperative position and a retracted position, a control valve assembly with which said de-boost piston is adapted to co-operate and which is adapted to control communication between said brake and said supply, said control valve assembly being movable between an open position when said de-boost piston is in said advanced position and a closed position when said de-boost piston is in said retracted position, means defining a space in said bore in communication with said working chamber and in which fluid from said pump is adapted to be trapped to hold said de-boost piston in said inoperative advanced position, a bleed device communicating with said space, said bleed device comprising a spool freely movable axially between an open position and a closed position, friction means for holding said bleed device in said open position during initial bleeding of said system, and pressure responsive means co-operating with said bleed device and responsive to fluid pressure in said system for urging said spool from said open position into said closed position, said pressure-responsive means being adapted to overcome said friction means automatically to urge said spool into said closed position when said fluid pressure attains a predetermined value.

4,648,665

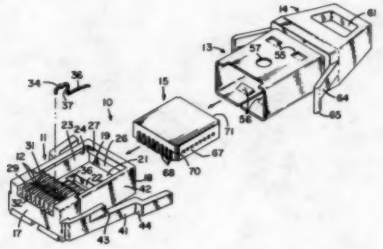
ELECTRONIC KEY ASSEMBLIES

Wayne S. Davis, Harrisburg; George R. Defibaugh, Mechanicsburg, and Jon A. Fortuna, New Cumberland, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 761,344, Jul. 31, 1985, which is a continuation of Ser. No. 669,554, Nov. 8, 1984, abandoned, which is a continuation-in-part of Ser. No. 661,498, Oct. 16, 1984, abandoned. This application Oct. 15, 1985, Ser. No. 787,288

Int. Cl.[4] H01R *13/627*

U.S. Cl. 339—14 R **3 Claims**



1. An electronic key assembly comprising an insulating plug body moulded from plastics material having a front, mating end for receipt in a jack and a rear end and formed with a chip carrier receiving cavity spaced rearwardly from the mating end;

a row of contact receiving recesses extending rearwardly from the mating end along a side of the body towards the cavity;

a series of contacts having first contact portions mounted in the recesses and exposed along the side of the body adjacent the mating end for engagement with spring contacts of a complementary jack and second spring contact portions extending into the cavity for engagement with respective leads of a chip carrier received in the cavity;

releasable resilient latch arm means extending rearwardly from the mating end, the cavity being adapted to receive a chip carrier comprising a printed circuit board and being open to a rear and a printed circuit board locating means extending forwardly from the rear to receive and guide the printed circuit board into the cavity and locate the printed circuit board in engagement with the second contact portions;

and a metal grounding plate having a planar portion seated against a base wall outside the cavity and at least one resilient contact leg extending perpendicularly of the planar portion through a slot formed in the base wall into alignment with the printed circuit board locating means for resilient engagement with a ground plane of a printed circuit board on insertion into the cavity.

4,648,666

ELECTRICAL CONNECTOR

Gregory R. Lovell, Lebanon, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 3, 1985, Ser. No. 751,760

Int. Cl.[4] H01R *9/09*

U.S. Cl. 339—17 CF **4 Claims**

1. An electrical connector for surface mounting a leadless chip carrier to a printed circuit board, comprising:

a dielectric frame member;

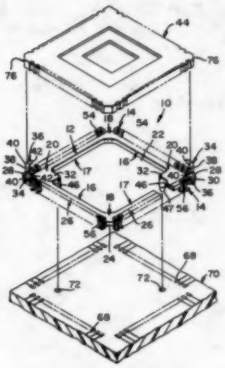
recesses at spaced intervals along the sides of the frame member;

projections extending outwardly from each of said recesses;

a plurality of contacts having intermediate sections with each section having a hole therethrough, said contacts being secured along the sides of the frame member with the intermediate sections being disposed in respective recesses with said holes receiving said projections therethrough and said projections being upset to secure said contacts in said recesses;

first contact sections of said contacts connected to said intermediate section and extending below and outwardly of said frame for soldered electrical connection with respective conductive pads of the printed circuit board; and

second contact sections of said contacts connected to said intermediate section and extending above and outwardly of said frame for soldered electrical connection with respective conductive pads of the leadless chip carrier.



4,648,667

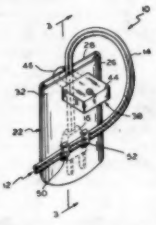
SECURITY DEVICE FOR ELECTRICAL PLUG

Herbert P. Baumgart, c/o Chicago Avenue Foods, 712 Chicago Ave., Maywood, Ill. 60153

Filed Jul. 19, 1985, Ser. No. 756,507

Int. Cl.[4] H01R *13/44*

U.S. Cl. 339—37 **7 Claims**



1. An apparatus for preventing the unauthorized use of an electrical device, the electrical device including an electrical conduit attached at one end to the electrical device, and at its other end to an electrical plug, the apparatus comprising:

an enclosure having a bottom and a peripherally extending side wall affording an inner chamber, the enclosure having an open top portion through which the electrical plug can be inserted for positioning in the chamber;

aperture means on opposite sides of the top portion of the enclosure;

a removable lock provided with a locking mechanism and a shackle, the shackle being selectively movable with respect to the locking mechanism between locked and unlocked positions, the shackle being of a size to pass through said aperture means to restrict the size of said open top portion and to capture the entire electrical plug

within the enclosure when the shackle is moved to locked positions; and

conduit securing means provided on the enclosure for retaining the electrical conduit and the enclosure in assembled relation.

4,648,668

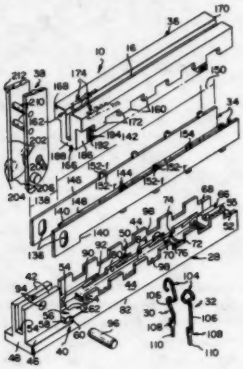
ZERO INSERTION FORCE CARD EDGE CONNECTOR

David B. Sinisi, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 26, 1986, Ser. No. 878,768

Int. Cl.[4] H01R 9/09

U.S. Cl. 339—74 R **22 Claims**



1. A zero insertion force, card edge connector for mounting on a backplane and receiving a daughter card therein to electrically interconnect conductive means on the backplane and daughter card, said connector comprising:

dielectric lower housing means having receiving means for receiving conductive contact means;

dielectric upper housing means positioned over said lower housing means for movement towards and away therefrom, said upper housing means having body means and cross member means on top and extending laterally over both sides of said body means, and with a longitudinal card slot extending through said cross member means and into said body means, said body means having transverse slots on both sides of and intersecting said card slot and opening out onto the sides and undersurface of said body means, said cross member means having downwardly open cam groove means positioned therein and located adjacent each side of said body means;

said contact means having lead means at one end and a C-shaped spring means at another end with contact member means thereon and bearing means at a free end thereof, said contact means being positioned in said receiving means in said lower housing means with said lead means extending outwardly from an underside thereof for electrical engagement with conductive means on the backplane and said spring means extending into said transverse slots in said upper housing means with said contact member means facing towards said card slot and said bearing means projecting out through the sides of said body means; and

cam means slidably positioned on said lower housing means and alongside said body means of said upper housing means and bearing against said bearing means of said spring means and further having cam follower means extending into said cam groove means in said cross member means so that by moving said cam means longitudinally, cooperation between said cam follower means and said cam groove means moves said cam means and said bearing means towards said card slot, forcing said contact member means into said card slot and into electrical engagement with conductive means on the daughter card that has been disposed therein.

4,648,669

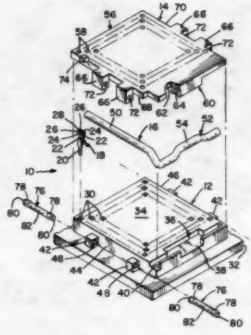
REMOVABLE RETAINING AND GUIDE MEANS FOR ELECTRICAL SOCKETS

Richard L. Marks, Mechanicsburg, and William T. Parker, Boiling Springs, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 6, 1985, Ser. No. 795,395

Int. Cl.[4] H01R 13/629

U.S. Cl. 339—75 M **7 Claims**



1. Removable retaining and guide means for electrical sockets of the type having an upper member slidably positioned on a base member and each member having hole-containing means with said means on the upper member being in alignment with said means on the base member so that the holes therein are coincidental one to the other, said removable retaining and guide means comprising a rigid pin received in said holes and having upset portions adjacent each end and guide means intermediate said upset portions, said upset portions being larger than said holes so that a reasonable force is required to pass said upset portions therethrough, thereby removably retaining said upper member to said base member and said guide means being smaller than said holes so that said upper member slides freely thereon and is guided thereby.

4,648,670

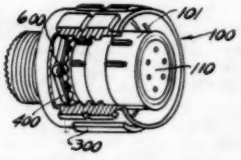
ELECTRICAL CONNECTOR ASSEMBLY HAVING ANTI-DECOUPLING MECHANISM

Stephen Punako, and David W. MacAvoy, both of Bainbridge, N.Y., assignors to Allied Corporation, Morristown, N.J.

Filed May 7, 1980, Ser. No. 147,699

Int. Cl.[4] H01R 13/62

U.S. Cl. 339—89 R **15 Claims**



1. In an electrical connector having

a first electrical connector including a shell having a plurality of electrical contacts mounted therein,

a second electrical connector including a second shell having a plurality of electrical contacts mounted therein and

mateable with the contacts in the first shell, said second shell having an external thread thereon, and

a coupling ring rotatably mounted on the first shell and adapted to selectively couple and decouple said first shell from said second shell, said coupling ring having an interior wall provided with internal threads connectable with the external threads on the second shell for connecting the first and second shells together and thereby holding respective contacts in the mated relationship,

means for retarding the rotational movement of the coupling ring with respect to the shells, said retarding means comprising:

a radial shoulder extending around the outer periphery of said first shell and having an outer circumferential surface thereof provided with a plurality of engageable teeth; and

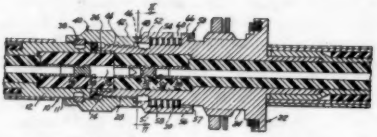
an integrally stamped and formed gullwing shaped leaf spring member including a central portion mounted to the coupling ring, and a pair of wings each extending from the central portion to a distal end disposed against the interior wall of the coupling ring, each of said wings including first and second portions with the second portion being integral with and folded over and onto the first portion, each said first portion having a forward surface facing radially inward in the direction of said first shell and including an enlarged medial portion for engaging the teeth to retard rotational movement, said medial portion extending inwardly of the forward surface in a radial direction from an imaginary line drawn between the ends of the wing first portion in the region of the coupling ring interior wall and towards the first shell.

4,648,671

SELF LOCKING COUPLING DEVICE

Yefim Torban, Cheshire, and Joseph Hary, Danbury, both of Conn., assignors to Allied Corporation, Morristown, N.J.

Filed May 29, 1986, Ser. No. 868,980
Int. Cl.[4] H01R *13/623*
U.S. Cl. 339—89 R **6 Claims**



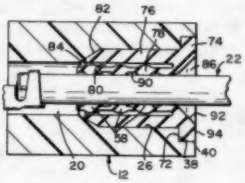
1. A self-locking electrical connector assembly comprising a receptacle, a plug, a coupling nut rotatably captivated on the plug for threadable engagement with the receptacle, and locking means for locking the assembly together when the coupling nut has drawn the plug into the receptacle, the locking means being operative only near fully mate and comprising a lock nut slidably mounted on the receptacle and axially constrained to move from a forward first position to a rearward second position, a spring resisting rearward movement of the lock nut and biasing the lock nut into the first position, adjustable retention means for changing the axial position of the lock nut relative to the receptacle and pre-loading the spring, the adjustable retention means comprising an L-shaped detent cavity disposed adjacent to the rearward end face of the lock nut, and a pin extending radially from the receptacle being received in the cavity, the cavity opening on the end face to receive the pin and including a pair of detents each for receiving the pin and constraining the lock nut for axial movement, and a first and second set of interengageable teeth each, respectively, being disposed on one and the other nut and adapted to engage with the other when mated.

4,648,672

WIRE SEAL

Robert J. Kobler, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 17, 1985, Ser. No. 735,886
Int. Cl.[4] H01R *4/00*
U.S. Cl. 339—94 M **12 Claims**



1. A wire sealing means for an electrical conductor having a terminal terminated on the end thereof and securable in a terminal-receiving cavity of an electrical connector housing, comprising an elastomeric wire seal having:

a transverse body section received in said terminal-receiving cavity;

a sleeve-like outer section extending forwardly from said transverse body section and having a preselected outer diameter;

a right cylindrical inner section extending forwardly from said transverse body section substantially coaxial with and located within said outer section and spaced radially inwardly from said outer section defining an annular gap therebetween; and

a profiled bore extending forwardly from a rear surface of said wire seal through said transverse body section and said inner section;

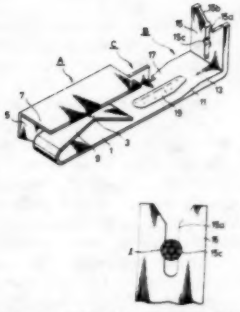
said inner section being elastically deformable radially outwardly into said annular gap.

4,648,673

WIRE-HARNESS FOR AUTOMOBILES

Takayoshi Endo, Shizuoka; Toshimasa Sugiyama, Numazu; Satoru Murofushi, Shizuoka, and Sakai Yagi, Gotenba, all of Japan, assignors to Yazaki Corporation, Tokyo, Japan

Division of Ser. No. 663,419, Oct. 22, 1984, Pat. No. 4,593,963.
This application Apr. 22, 1986, Ser. No. 854,490
Claims priority, application Japan, Oct. 26, 1983, 58-199163
Int. Cl.[4] H01R *4/24*
U.S. Cl. 339—97 R **19 Claims**



1. A wire harness of the slotted terminal type comprising a plurality of coated multi-strand wires and a slotted terminal connected to each coated wire, wherein each coated wire is a twisted and compressed wire having an annularly uniform arrangement of strands of conductive material formed by

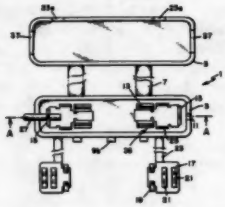
compressing twisted concentric stranded wire to eliminate gaps from between the strands, and wherein each slotted terminal comprises a contact portion and a wire connecting portion having a slotted opening for receiving a wire therein, the width of said slotted opening being less than the diameter of the coated wire connected to the terminal such that the coating is broken when the wire is forced into the slotted opening and the sides of the slotted opening tightly engage strands of conducting material in metal to metal contact relationship without distorting the annularly uniform arrangement of the strands.

4,648,674

IN-LINE FUSEHOLDER

Joseph J. Sanchez, Jr., Elgin, Ill., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jul. 1, 1985, Ser. No. 749,970
Int. Cl.[4] H01R 4/24
U.S. Cl. 339—97 P **11 Claims**



1. A fuseholder assembly comprising:

(a) unitary housing means for housing fuse clip means and electrical contact means therein, and said unitary housing means having access means for providing access to electrical conducting reans to the interior of said unitary housing means;

(b) cover means integral with said unitary housing means and constructed for closing-off access to the interior of said unitary housing means;

(c) electrical contact means disposed in said unitary housing means for being connected to electrical conducting means;

(d) fuse clip means disposed in said unitary housing means for holding fuse means therein, said fuse clip means being in electrical connection with said electrical contact means in a manner for establishing a conductive path through fuse means in electrical connection with said fuse clip means; and

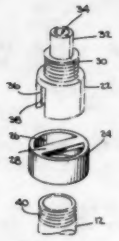
(e) separate wire securing means integral with said housing, movable from a first open position to a second closed and latched position for urging electrical conducting means into a position with respect to said electrical contact means for establishing electrical contact connection between said electrical conducting means and said electrical contact means in a strain relief manner with respect to said electrical conducting means, and for preventing access, in a secure and insulative manner, to said connection between said electrical conducting means and said electrical contact means whereby said cover means can be opened for changing fuse means without disrupting the electrical connection between said electrical contact means and electrical conducting means.

4,648,675

ELECTRICAL CONNECTION APPARATUS FOR LIGHTING FIXTURES

Bernard S. Gaines, Roslyn Heights, N.Y., assignor to Trine Products Corp., Bronx, N.Y.

Continuation of Ser. No. 701,340, Feb. 14, 1985, abandoned.
This application Jul. 2, 1986, Ser. No. 881,578
Int. Cl.[4] H01R 4/02
U.S. Cl. 339—97 P **8 Claims**



1. An electrical connector for providing an electrical connection between an electrical device and a multi-conductor cable with insulation around the conductors, said connector comprising:

a socket having a hollow and internally threaded lower portion extending around an axis and defining a cable receiving area and providing an opening for receiving an externally threaded support member, having an upper portion and having slots in the lower portion and at opposite sides of said axis for receiving a cable and permitting it to extend through said cable receiving area, said socket comprising a pair of molded half sections matable along a plane extending substantially parallel to said axis;

each said half section comprising, in the lower portion thereof, molded internal thread portions which mate with the internal threads of the mating other half section to form said internally threaded portion of said socket and comprising, in the upper portion thereof, a pair of spaced conductor lead receiving grooves which extend in the direction of said axis and which mate with the grooves of the other half section to form conductor lead receiving grooves which restrain conductor leads therein with respect to axial and circumferential movement when the half sections are mated to form said socket;

a pair of conductor leads each having a pointed end, one conductor lead mounted in one of said pair of grooves of one of said half sections and one of said pair of grooves of the other half section with the pointed end thereof extending into said cable receiving area and the other conductor lead mounted in the other of said pair of grooves of said one of said half sections and in the other of said pair of grooves of said other half sections with the pointed end thereof extending into said cable receiving area, each of said pair of conductor leads being removable from said pair of grooves upon separation of said socket half sections and being restrained from axial and circumferential movement when in said pair of grooves and said socket half sections are in mating relationship;

means for retaining said half sections in mating relation; and

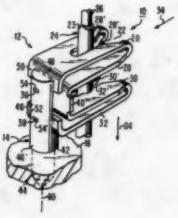
means in said lower portion of said socket for engaging a cable within said cable receiving area and pressing it against said pointed end of each conductor lead for thereby contacting a conductor lead with a conductor of said cable.

4,648,676

TERMINAL

Ross M. Carrell, Cinnaminson, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 28, 1985, Ser. No. 738,394
Int. Cl.[4] H01R 4/24
U.S. Cl. 339—97 R 1 Claim



1. A printed circuit board terminal for receiving an insulated electrical conductor comprising:

a post having a tip portion adapted to be passed through a printed circuit board aperture and a shoulder portion adapted to abut a surface of the printed circuit board;

first and second pairs of parallel tines secured at one end thereof to and cantilevered from said post normal to the post, each pair of tines including spaced straight parallel edges for grasping the insulation of said electrical conductor;

a third and fourth pair of parallel tines, each pair including spaced straight parallel edges for cutting through said insulation and electrically contacting said conductor, said third and fourth pair being coupled to each other at one end, the other ends of the first and third pair being coupled to each other and the other ends of the second and fourth pair being coupled to each other; and

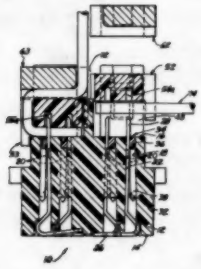
a rib secured to the post adjacent the one end of and extending normal to the first and second pair of tines.

4,648,677

ELECTRICAL CONNECTOR ASSEMBLY AND METHOD FOR TERMINATING CABLE

Roger J. Lang, Garden Grove, Calif., assignor to Allied Corporation, Morristown, N.J.

Filed May 31, 1985, Ser. No. 740,096
Int. Cl.[4] H01R 4/24
U.S. Cl. 339—99 R 18 Claims



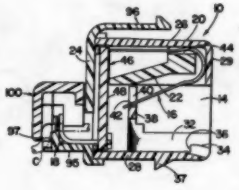
1. A connector for terminating a multi-conductor ribbon cable comprising an elongated base member having a mating-face, a wire terminating face, and a pluality of terminal receiving passages extending between the faces with a terminal disposed in each respective passage, each terminal extending beyond the terminating face, and means for strain relieving the termination, characterized by a pair of stackable first and second covers, and means for latching the covers about the terminating face, each said cover including an elongated body having at each end a pair of lips turned inwardly so as to define a groove, the latch means including four latch plates each extending upwardly from the base member for latching to the lateral end faces of one and the other pair of first and second covers, each plate being received in the spaced grooves whereby the covers may be driven downwardly towards the terminating face such that the second covers define a lateral slot therebetween, the terminated cable having a first portion pressed on the mating face, a second portion perpendicular to the mating face, a third portion sandwiched between the first pair of covers, and a fourth portion extending perpendicularly to the mating face and through the slot.

4,648,678

ELECTRICAL CONNECTOR

Lee A. Archer, Ashville, N.C., assignor to Brand-Rex Company, Willimantic, Conn.

Filed Jul. 1, 1985, Ser. No. 750,903
Int. Cl.[4] H01R 4/24
U.S. Cl. 339—99 R 12 Claims



1. An electrical connector comprising a dielectric housing defining a forwardly opening plug receiving cavity, a transversely spaced apart series of substantially identical resilient unitary cantilever spring contacts supported within said housing, each of said contacts having elongated first and second legs and a parti-circular arcuate reversely bent connecting portion substending an arc of at least 180 degrees and having an unsupported parti-circular inner surface spaced from said housing, said connecting portion having a first end integrally connected to the forward end of said first leg at a first distinct junction and a second end integrally connected to the forward end of said second leg at a second distinct junction, said first leg extending rearwardly from said first distinct junction and having a rear end portion secured in fixed position to said housing, said second leg extending rearwardly and downwardly from said second distinct junction and having a rear end portion free to move relative to said housing, said second leg having at least a portion thereof exposed within said plug receiving cavity, and means for connecting an associated electrical conductor to each of said resilient spring contacts.

4,648,679

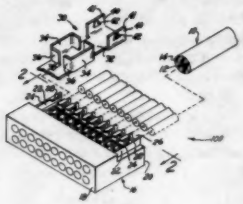
CONNECTOR ASSEMBLY FOR MASS TERMINATION

Walter J. Pelczarski, Downers Grove, Ill., assignor to Allied Corporation, Morristown, N.J.

Filed Nov. 15, 1985, Ser. No. 798,531
Int. Cl.[4] H01R 4/24
U.S. Cl. 339—99 R 5 Claims

1. A solderless terminal for electrically and mechanically terminating an insulated electrical wire, the terminal comprising an insulation displacing portion and characterized by a U-shaped channel including a wire retention portion comprising a wire receiving opening having wire engaging means formed integrally therewith and means to compress said wire engaging means into engagement with a circumferential, longitudinally extending, portion of said wire and to maintain that engagement, the means to compress comprising the channel

including a base having a pair of longitudinally extending sidewalls, the wire engaging means comprising a pair of ribs each extending laterally toward the other from one respective sidewall and being substantially nondeformed upon receipt of



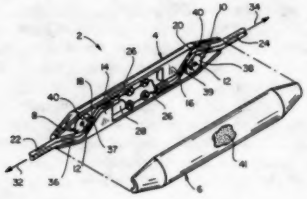
its respective wire, each said rib being formed by its longitudinal sidewall having been reversely bent so as to form a longitudinally extending, Vee-shaped section with the apex of each Vee being generally in a plane parallel to and spaced from said base.

4,648,680

DROP-WIRE CLOSURE HAVING FIRST AND SECOND CAMS

Jose P. Gamarra, Union City, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Feb. 6, 1985, Ser. No. 698,644
Int. Cl.[4] H01R *4/40*
U.S. Cl. 339—105 **12 Claims**



1. A closure comprising:

first and second pivoted cam means;

means confronting the first and second cam means and cooperating therewith to define first and second variable-sized passageways, a first cable being inserted through the first passageway and a second cable being inserted through the second passageway;

the first and second cam means being pivoted and oriented so as to decrease a size of the first and second variable-sized passageways, respectively, in response to pull-out forces exerted on either the first or second cable; and

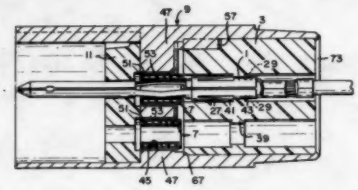
further comprising a first electrical connection bar having at least one electrical connection port thereon adapted to be electrically connected to an electrical conductor of one of the first and second cables.

4,648,681

FILTERED ELECTRICAL PLUG

Raymond V. Pass, Camp Hill; James L. Schroeder, III, Palmyra, and Reuben E. Ney, Mount Joy, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 684,229, Dec. 20, 1984, abandoned. This application Apr. 21, 1986, Ser. No. 856,429
Int. Cl.[4] H01R *33/945*
U.S. Cl. 339—147 R **14 Claims**



1. An electrical connector for connection with a complementary electrical connector, comprising:

a conductive shell member having a unitary conductive transverse wall, said wall having a plurality of first passageways extending axially therethrough;

a first dielectric housing member having a plurality of second passageways therein, said first dielectric housing member being disposed within said conductive shell member on one side of said conductive transverse wall such that said second passageways of said first dielectric housing member are in alignment with a first end of said first passageways in said conductive transverse wall;

a second dielectric housing member having a plurality of third passageways therein, said second dielectric housing member being disposed within said conductive shell member on another side of said conductive transverse wall such that said third passageways are in alignment with a second end of said first passageways in said conductive transverse wall;

filter means secured in said first passageways of said conductive transverse wall and being electrically coupled thereto so as to define a grounding means;

electrical terminal means having a contact section; a filter engaging section and a conductor securing section, said electrical terminal means being positioned respectively in the aligned passageways with said filter engaging section being disposed along said filter means in electrical engagement therewith;

first and second dielectric housing retention means for retaining said dielectric housing members in said conductive member; and

means provided by said first dielectric housing member for retaining said terminal means in said connector.

4,648,682

MODULAR ADAPTER AND CONNECTOR CABLE FOR VIDEO EQUIPMENT

Joseph T. Tubbs, Lynchburg, Va., assignor to 501 Trans World Connections Ltd., Lynchburg, Va.

Filed Jun. 11, 1985, Ser. No. 743,707
Int. Cl.[4] H01R *13/50*
U.S. Cl. 339—154 A **6 Claims**

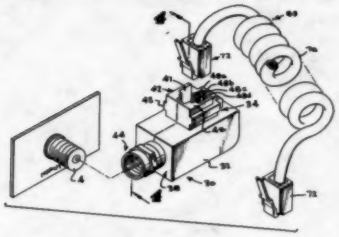
1. Apparatus for connecting the VHF output terminal of a video cassette recorder to a 75 ohm input terminal of video equipment, comprising:

first and second modular adapters, each said adapter comprising:

an insulating housing comprising a modular jack portion having a modular jack-receiving opening extending therein and a coaxial connector portion having a coaxial connector-receiving opening extending therein;

a standard six-position modular telephone jack positioned in said modular jack-receiving opening, said jack having at least first and second conductors mounted therein in two of said six positions; and

a male coaxial connector positioned in said coaxial connector-receiving opening and comprising a solid central conductor and a conductive wire sheath insulated from said solid central conductor, said solid central conductor being electrically connected to said first conductor of said modular jack and said conductive wire sheath being electrically connected to said second conductor of said modular jack; and



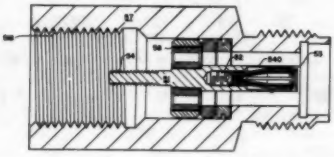
a connector cable comprising an insulated cable having first and second ends terminated respectively by first and second standard, six-position modular telephone connectors insertable into said first and second modular jack, said insulated cable having at least first and second insulated conductive wires therein and each of said telephone connectors having only first and second conductive terminals contained therein piercing said first and second wires, respectively, said first and second conductive terminals being positioned in two of said six positions of said telephone connectors corresponding to the positions in which said first and second conductors are mounted in said telephone jack.

4,648,683

ADJUSTABLE LENGTH SLOTLESS FEMALE CONTACT FOR CONNECTORS

Julius Botka, Santa Rosa, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 28, 1985, Ser. No. 738,632
Int. Cl.[4] H01R *17/18*
U.S. Cl. 339—177 R **11 Claims**



1. A connector comprising:

an outer conductor contact having a first end for making contact with an outer conductor contact of an associated connector, said outer conductor contact having an interior cavity that is connected to an opening in the first end;

a center conductor contact having a first shoulder, said center conductor contact being located within the interior cavity of the outer conductor contact; and

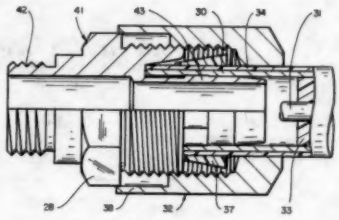
plastically deformable means for adjusting the length of the center conductor contact relative to the length of the outer conductor contact to make said first shoulder flush with said end of the outer conductor contact.

4,648,684

SECURE CONNECTOR FOR COAXIAL CABLE

John S. Mattis, Sunnyvale; Jorgen Berth, Los Altos, and Gilbert E. Locke, San Mateo, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 560,081, Dec. 9, 1983, abandoned. This application Jul. 9, 1985, Ser. No. 753,353
Int. Cl.[4] H01R *17/18*
U.S. Cl. 339—177 R **4 Claims**



1. A connector for a coaxial cable, the cable having a substantially rigid electrically conductive jacket, a center conductor and electrical insulation means there-between, said connector comprising:

a body containing electrically-insulating means for holding and insulating from electrical contact with the body the center conductor or a pin attached to the center conductor;

a mandrel adapted for maintaining electrical contact with the jacket and the body while allowing the center conductor to pass through without electrical contact with the mandrel or body;

means for gripping the jacket to maintain electrical contact between the jacket and the mandrel;

a clamp nut adapted for holding the mandrel in electrical contact with the body or for holding the means for gripping the jacket in electrical contact with the mandrel;

means for securing the clamp nut and the body together to prevent rotation of the clamp nut relative to the body, said securing means being adapted to deform upon rotation of the clamp nut relative to the body and provide a visual indication that such rotation has occurred;

the body having a flattened surface area on the exterior thereof and the means for securing the clamp nut and the body together is a skirt on the clamp nut extending over the flattened surface area of the body and a portion thereof being adapted for crimping against said flattened surface, the skirt portions being crimped against the flattened surface area.

4,648,685

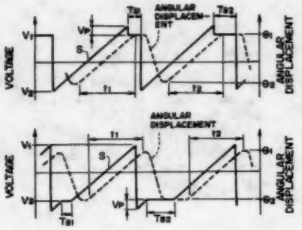
METHOD OF DRIVING GALVANOMETER MIRROR

Nobutaka Fukai; Yuji Ohara, and Toshitaka Agano, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 14, 1985, Ser. No. 765,481
Claims priority, application Japan, Aug. 16, 1984, 59-170797
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.6 **3 Claims**

1. A method of driving a galvanometer mirror in reciprocating angular movement by supplying a drive current generated by a sawtooth voltage waveform, comprising the steps of:

(i) applying the sawtooth voltage waveform until the voltage reaches a peak value exceeding a prescribed voltage value at which said galvanometer mirror is angularly displaced through a maximum angle at one stroke end of the reciprocating angular movement thereof;



(ii) changing the voltage from said peak value to said prescribed voltage value after said galvanometer mirror has been angularly displaced through said maximum angle; and

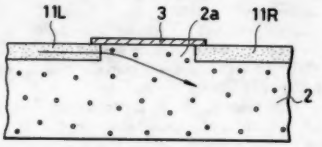
(iii) keeping the voltage at said prescribed voltage value for a time interval to attain a desired period of the reciprocating angular movement of said galvanometer mirror.

4,648,686

OPTICAL SWITCH ARRAY

Hideo Segawa, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Oct. 28, 1982, Ser. No. 437,451
Claims priority, application Japan, Oct. 28, 1981, 56-171341
Int. Cl.[4] G02B *6/10*
U.S. Cl. 350—96.13 **10 Claims**



1. An optical switch array comprising:

a substrate having a main surface, said substrate containing a generally uniform distribution of Na^+ ions at least in the vicinity of said main surface;

a plurality of inlet light-transmitting channels formed in said main surface, said inlet light-transmitting channels being arranged in parallel and spaced apart from one another and including entrance end faces at one end and exit faces at the other end whereby desired light waves may be introduced into said inlet light-transmitting channels through said entrace end faces, said inlet light-transmitting channels being defined by having some of said Na^+ ions substituted by Ag^+ ions or K^+ ions;

a plurality of outlet light-transmitting channels formed in said main surface such that each of said outlet light-transmitting channels is in line with the corresponding one of said inlet light-transmitting channels with a predetermined gap therebetween thereby defining an intermediate region between said inlet and outlet light-transmitting channels in said substrate, said intermediate region being comprised of a material having a temperature dependent index of refraction which is normally lower in value than but becomes comparable in value, when heated, to the index of refraction of said channels, said outlet light-transmitting channels being defined by having some of said Na^+ ions substituted by Ag^+ ions of K^+ ions; and

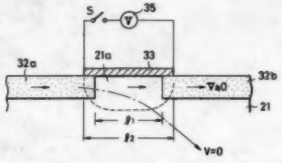
means for heating said intermediate regions selectively thereby optically coupling the selected pair of inlet and outlet light-transmitting channels to allow transmission of light waves from said inlet to outlet light-transmitting channels.

4,648,687

OPTICAL SWITCHING DEVICE

Taizo Yoshida, Ikeda; Masaaki Mori, Kawasaki; Jiro Koyama, Suita, and Masamitsu Haruna, Toyonaka, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Sep. 30, 1982, Ser. No. 431,020
Claims priority, application Japan, Oct. 2, 1981, 56-156116; Oct. 2, 1981, 56-156117
Int. Cl.[4] G02B *6/10*
U.S. Cl. 350—96.13 **22 Claims**



1. An optical switching device comprising:

a substrate of a material having a temperature dependent index of refraction;

a main waveguide formed in the surface of said substrate;

an auxiliary waveguide formed in the surface of said substrate branching out from said main waveguide, said main and auxiliary waveguides being formed by selectively diffusing a selected material into the surface of said substrate so that said waveguides have an index of refraction different from said substrate; and

heating means for selectively heating selected portions of said main and auxiliary waveguides at an intersection therebetween to thereby locally change the index of refractions of said selected portions such that said main and auxiliary waveguides are optically coupled so that light waves introduced into said main waveguide are substantially switched into said auxiliary waveguide when said heating means is activated; whereas, said main and auxiliary waveguides are optically decoupled so that light waves are not substantially switched into said auxiliary waveguide when said heating means is not activated.

4,648,688

CONNECTOR FOR FIBER OPTIC MEMBER INCLUDING POLISHING FIXTURE AND METHOD OF TERMINATING SAME

John J. Ashman, and Bernard G. Caron, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 381,495, May 24, 1982. This application Mar. 25, 1985, Ser. No. 719,022
Int. Cl.[4] G02B *6/36, 7/26*; B24B *23/00*
U.S. Cl. 350—96.20 **34 Claims**

1. A polishing fixture for polishing a front end of a ferrule member and a front end of a fiber optic transmission member secured in a bore of the ferrule member, comprising:

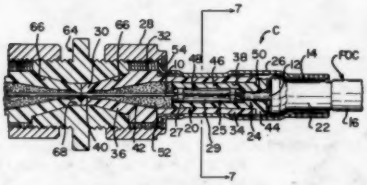
a body member having a front flat surface and a profiled bore extending therethrough in which a profiled front end of the ferrule member is to be disposed with a front surface of the ferrule member extending outwardly beyond said front flat surface, said profiled bore being dimensioned to compress a front section of the ferrule member in tight engagement with the fiber optic transmission member in the bore of the ferrule member;

means for securing the ferrule member to said body member; and

means on said front flat surface to stabilize polishing of the front surface of the ferrule member and the front end of the fiber optic transmission member when the body member with said front section of said ferrule member secured therein is held against a polishing film and moved with respect thereto during the polishing thereof and to control the polishing so that the front surface of the ferrule member and the front end of the fiber optic transmission member are polished and are in the same plane.

30. A method of terminating a connector onto an end of fiber optic cable means, characterized by the steps of:

placing an insert member having rod members there in and a fiber-receiving opening between said rod members onto



a section of a fiber optic member of the fiber optic cable means with an end portion of the fiber optic member spaced forwardly therefrom;

inserting said insert member with the section of the fiber optic member therein into an opening of a ferrule member with the end portion of the fiber optic member disposed in a front section of said opening and said insert member disposed in a rear section of said ferrule member; and

controllably crimping a crimping ferrule on said rear section of said ferrule member thereby reducing said rear section and moving the rod members in said insert member thereunder into securing engagement with the section of the fiber optic member which secures the fiber optic member in said insert member and said insert member in said ferrule member.

4,648,689

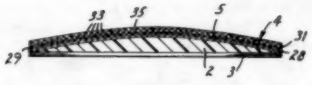
PAVEMENT MARKING TAPE

David C. May, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 483,603, Apr. 11, 1983, Pat. No. 4,534,673. This application May 3, 1985, Ser. No. 730,431

Int. Cl.⁴ G02B *5/12*

U.S. Cl. 350—105 **6 Claims**



1. A pavement marking tape comprising a strip of cellular elastomer having a compressive strength of less than about 100 kiloPascals at 25 percent compression, said strip having a reflective layer on its top surface and an adhesive on the bottom surface for adhering it to a road surface.

4,648,690

LIGHT DIFFUSING DEVICE

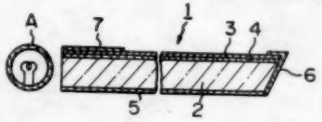
Makoto Ohe, Tokyo, Japan, assignor to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Filed May 1, 1985, Ser. No. 729,361

Claims priority, application Japan, Aug. 27, 1984, 59-176758

Int. Cl.⁴ G02B *26/02, 17/00*

U.S. Cl. 350—321 **12 Claims**



1. A light diffusing device comprising:

a transparent light transmitting base plate wherein at least one edge face of said base plate is a light incident face;

a light diffusing layer formed on at least a first surface of said base plate wherein said light diffusing layer comprises a polymer product prepared by multi-stage polymerization of an alkyl methacrylate as a component;

a light reflection surface formed in the vicinity of a second surface of said base plate;

an intermediate layer formed between said base plate and said light diffusing layer to integrally bond together said base plate and said light diffusing layer.

4,648,691

LIQUID CRYSTAL DISPLAY DEVICE HAVING DIFFUSELY REFLECTIVE PICTURE ELECTRODE AND PLEOCHROIC DYE

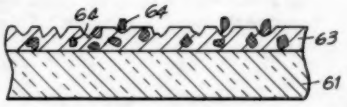
Koichi Oguchi; Misoru Hosokawa; Satoru Yazawa, and Mitsuo Nagata, all of Suwa, Japan, assignors to Seiko Epson Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1980, Ser. No. 218,582

Claims priority, application Japan, Dec. 27, 1979, 54-173050

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—338 **46 Claims**



1. A liquid crystal display device comprising a substrate and an opposed transparent electrode plate spaced apart from said substrate for defining a space therebetween, a liquid crystal material in said space, liquid crystal driving elements arranged in a matrix array on said substrate forming a matrix of liquid crystal display elements adapted to be displayed by selectively applying a potential to said liquid crystal driving elements in response to external signals, said substrate having a thin film layer thereon, said thin film layer including at least one metal thin film layer having a rugged diffusing surface and the surface of said thin film layer appearing diffusing white, said thin metal film layer serving as a liquid crystal driving electrode and the liquid crystal material being a guest-host liquid crystal including a pleochroic dye.

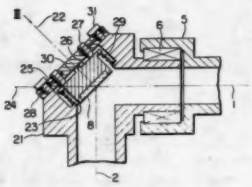
46. A base plate for a liquid crystal display device including a guest-host liquid crystal material comprising a substrate having at least one metal thin film layer having a rugged diffusing white surface, wherein said metal thin film layer with a rugged diffusing surface is selected from the group consisting of aluminum, an aluminum alloy, silver and a silver alloy thin film layers, said layer formed by vacuum evaporation and recrystallized by heat treatment.

4,648,692

MANIPULATOR DEVICE FOR A REFLECTING MIRROR

Tsuyoshi Kinoshita, Nishisonogi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 759,676, Jul. 29, 1985, abandoned. This application Jun. 24, 1986, Ser. No. 879,491
Claims priority, application Japan, Jul. 30, 1984, 59-157633
Int. Cl.[4] G02B *7/18*; H01S *3/08*; A47G *1/16, 1/24*
U.S. Cl. 350—632 3 Claims



1. A manipulator device including a reflecting mirror for reflecting a laser beam comprising:

adjoining longitudinally extending arms having axial passages and mounted perpendicular to each other;

means including a right angle joint portion for mounting one of said arms for rotation about the longitudinal axis of the other of said arms, the longitudinal axes intersecting in said joint portion;

a housing included in said joint portion for mounting a holder for said reflecting mirror, a receiver for said mirror holder mounted in said housing having an outer face opposing an inner face of said mirror holder;

adjustable means for mounting said mirror holder on said receiver so that the face of said mirror is held at said intersection at substantially 45 degrees to said longitudinal axes so as to reflect an incident laser beam along one of said axes to an outgoing beam along the other axis;

said adjustable means including:

spring means connected to said housing resiliently urging said mirror holder toward said receiver;

first means for fastening said receiver to said housing; and

second means for adjusting the angle of said mirror relative to said axes.

4,648,693

REAR VIEW MIRROR

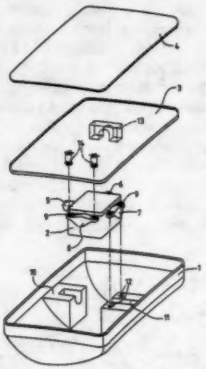
Dieter Lösch, Nuremberg, Fed. Rep. of Germany, assignor to Gebr. Buhler Nachfolger GmbH, Nuremberg, Fed. Rep. of Germany

Filed Feb. 4, 1985, Ser. No. 698,374
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407523
Int. Cl.[4] B60R *1/06*; G02B *5/08*
U.S. Cl. 350—636 5 Claims

1. A rearview mirror for vehicles which is adjustable in two planes, comprising a mirror housing containing a mirror-glass, a mirror-glass support in said mirror housing to support the mirror-glass arranged in the mirror housing, a universal joint coupling the support with the housing, an adjustable drive, a drive housing accommodating said adjustable drive, the universal joint having a pair of joint shafts, adjustment of the mirror-glass support relative to the mirror housing being obtained by actuation of the adjustable drive on the universal joint shafts, characterized in that the universal joint shafts:

(a) are both connected with the drive housing,

(b) are acted upon directly by the adjustable drive, and



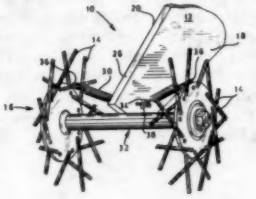
(c) can be rotated independently from each other, one of said shafts being attached to the mirror-glass support and the other shaft to the mirror housing.

4,648,694

BICYCLE WHEEL SAFETY ATTACHMENT

Edward Bean, 416 Powder Mill Rd., Nashville, Tenn. 37205

Filed Jun. 21, 1985, Ser. No. 747,257
Int. Cl.[4] G02B *5/12*
U.S. Cl. 350—99 12 Claims



11. A safety attachment for being releasably mounted on a wheel of a vehicle for enhancing the visibility of said vehicle, said vehicle wheel comprising a hub defining first and further opposite end portions, a rim for supporting a suitable tire, a first plurality of spokes radiating from said first opposite end portion of said hub and engaging said rim at preselected intervals, and a second plurality of spokes radiating from said further opposite end portion of said hub and engaging said rim at selected intervals alternating with spokes of said first plurality of spokes, said wheel safety attachment comprising:

a display panel for being releasably mounted between said first plurality of spokes and said second plurality of spokes in a plane perpendicular to said hub, said display panel defining oppositely disposed first and second display surfaces, and further defining an outer edge portion contoured to match said rim and an inner portion, said outer edge portion having a sufficient width to interleave at said rim with at least two of said first plurality of spokes andd at least one of said second plurality of spokes, said display panel further comprising first and second fastening eyes, said first fastening eye being mounted on said first display surface of said panel proximate said inner portion of said panel, and said second fastening eye being mounted on said second display surface of said panel proximate said inner portion of said panel; and

spring biased fastening means for releasable securing said display panel in position between said spokes with said outer edge portion in contact with said rim, said fastening means comprising a pair of spring members, each of said spring members provided with a first hooked end portion for being received in one of said fastening eyes and a second hooked end portion for releasably engaging at least one of said spokes of said wheel.

4,648,695

ILLUMINATION APPARATUS FOR TESTING PHOTOELECTRIC TRANSDUCER DEVICE

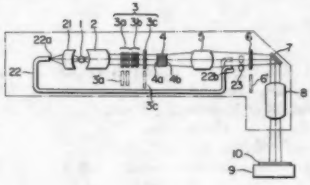
Norio Mizutani, Kawasaki, and Toshiyuki Kasai, Matsudo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 1, 1984, Ser. No. 636,838

Claims priority, application Japan, Aug. 10, 1983, 58-146144; May 22, 1984, 59-102809

Int. Cl.⁴ G03B *21/20*

U.S. Cl. 353—28 **11 Claims**



1. An illumination apparatus for testing a photoelectric transducer device, including:

(a) a main optical system for uniformly illuminating said photoelectric transducer device, said main optical system having a projection objective lens for projecting a pattern image of a test chart member onto said photoelectric transducer device, a light source for supplying illumination light rays to said test chart member, a collimator lens for converting the light rays from said light source to collimated light rays, an optical integrator disposed in the collimated light rays so as to form a plurality of images of said light source, and a condenser lens for forming the plurality of images of said light source on an entrance pupil of said projection objective lens;

(b) an auxiliary optical system for collecting other light rays excluding the light rays incident from said light source on said collimator lens; and

(c) adding means for adding said auxiliary optical system to said main optical system;

wherein said auxiliary optical system comprises a first focusing lens for focusing the other light rays exclusing the light rays incident from said light source on said collimator lens, an optical guide member for guiding the light rays focused by said first focusing lens to a portion between said test chart member and said condenser lens, and a second focusing lens for focusing the light rays from an exit end of said optical guide.

4,648,696

35 MM AUTOMATIC FOCUS CAMERA CONTAINING AN INSTANT FILM

Sea C. Park, and In P. Park, both of 3836 Birchwood, Skokie, Ill. 60067

Filed Aug. 13, 1985, Ser. No. 765,222

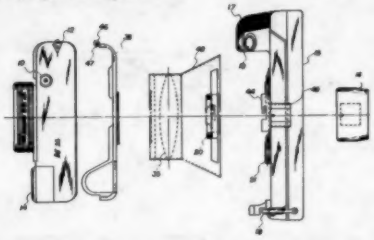
Int. Cl.⁴ G03B *17/50*

U.S. Cl. 354—83 **25 Claims**

1. A 35 mm automatic focus camera modified to be operated as a mid format or large format camera which comprises:

a 35 mm automatic focus camera having a casing provided with a removable back portion, said back portion having been removed,

a lens housing attached to the back of the 35 mm camera, said lens housing containing an achromatic lens system for magnifying the image, and



a film back means attached to the lens housing, said film back means being adopted to house film to be utilized.

4,648,697

ADAPTER FOR TRIPODS

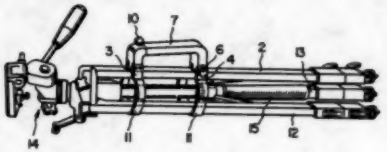
Michio Kawazoe, 30-11 5-chome, Narita Higashi, Suginami-ku, Tokyo, Japan

Filed May 22, 1985, Ser. No. 737,225

Claims priority, application Japan, Mar. 19, 1985, 60-40449[U]

Int. Cl.⁴ G03B *17/56, 15/03*; F16M *11/26*

U.S. Cl. 354—293 **3 Claims**



1. An adapter for tripods comprising; a first slider means movably clamped on a leg of said tripod; a second slider means movably clamped on said tripod leg; handle means pivotably mounted on said first sllider means for pivotal movement bridging said first and second sliders in a closed position to a second position extending outward from said leg; screw threaded means on the end of said handle means for securing the free end of said handle to said second slider means when bridging said sliders; said screw threaded means permitting mounting of camera accessories when said handle is in its extended position.

4,648,698

TRIPOD FOR CAMERA

Osamu Iwasaki, Tokorozawa, Japan, assignor to Hakuba Shashin Sagyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1985, Ser. No. 814,210

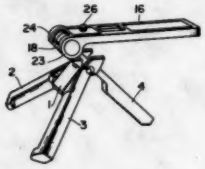
Claims priority, application Japan, Sep. 13, 1985, 60-139573[U]

Int. Cl.⁴ G03B *17/00*; F16M *11/38*

U.S. Cl. 354—293 **1 Claim**

1. A tripod for a camera which comprises a left leg, a right leg and a center leg which are connected so as to extend adjacently in parallel with each other in the same plane when they are not used, said left leg and said right leg being pivotably connected, at a portion where the three legs are connected, so as to be swung within a predetermined angular range in said

plane in the leftward and rightward directions, respectively, to be opened or closed, and said center leg being pivotably connected to said portion so as to swing in a direction perpendicular to said plane to be opened to closed.

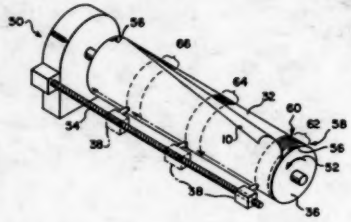


4,648,699

POINT CONTACT DEVELOPMENT OF IMAGING SHEETS EMPLOYING PHOTOSENSITIVE MICROCAPSULES

Mark Holycross, Centerville; Edward J. Saccocio, Columbus, and Scott Proehl, Miamisburg, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Oct. 31, 1985, Ser. No. 793,374
Int. Cl.[4] G03D *5/02*
U.S. Cl. 354—297 **8 Claims**



1. Apparatus for rupturing photosensitive microcapsules which form a photosensitive layer on the surface of imaging material comprising:

support means for receiving said imaging material;

point contact means positioned adjacent to said support means for defining at least one point contact, said point contact means being resiliently biased into continuous engagement with said support means to apply at least one point of uniform rupturing force to imaging material secured to said support means;

motive means for causing relative movement between said support means and said point contact means whereby a uniform rupturing force is applied to substantially the entire imaging area of said imaging material thereby rupturing said microcapsules within said imaging area.

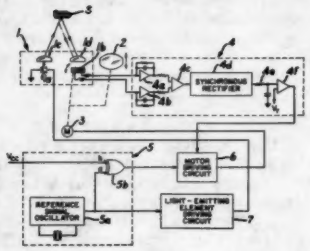
4,648,700

DISTANCE DETECTING DEVICE FOR A CAMERA

Shinji Nagaoka, Yotsukaido, Japan, assignor to Seiko Koki Kabushiki Kaisha, Chiba, Japan

Filed May 24, 1985, Ser. No. 738,093
Claims priority, application Japan, May 25, 1984, 59-106206
Int. Cl.[4] G03B *3/00*
U.S. Cl. 354—403 **1 Claim**

1. A distance detecting device for a camera of the type wherein a light emitting element and a light receiving element are relatively scanned by a scanning means, characterized in that it comprises a first pulse generating means for outputting clock signals of a predetermined fixed frequency to drive said light emitting element to flicker, and a second pulse generating means for outputting pulse signals of a width corresponding to a space between said clock signals to drive said scanning means.

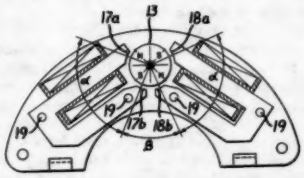


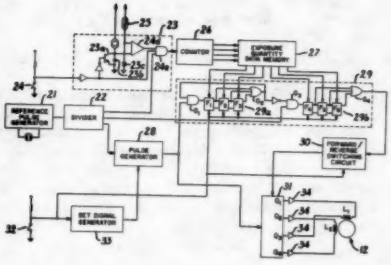
4,648,701

CONTROL CIRCUIT FOR PROGRAM SHUTTER

Masuo Ogihara; Hajime Oda; Yoichi Seki, and Hiroshi Yamazaki, all of Yotsukaido, Japan, assignors to Seiko Koki Kabushiki Kaisha, Chiba, Japan

Filed May 14, 1985, Ser. No. 734,039
Claims priority, application Japan, May 30, 1984, 59-110311
Int. Cl.[4] G03B *7/08*
U.S. Cl. 354—439 **1 Claim**





1. In a program shutter including sectors forming a lens aperture and a forwardly/reversely rotatable step motor for opening and closing said sectors, a control circuit for said program shutter comprising a control unit comprising a motor control data storing means for receiving a step drive number and an interpolation quantity corresponding to an exposure quantity as a data and storing the exposure quantity in an address, a pulse generator means for generating a step drive pulse and a clock pulse, a first counter means for presetting the step drive number before opening of said sectors and before inversion of said step motor and adapted to be counted down by the step drive pulse from said pulse generator means, a second counter means for presetting the interpolation data

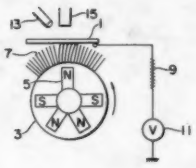
before count-up of said first counter means and adapted to be counted down by the clock pulse, an inversion drive means for detecting a timing when said second counter means is counted up and reversely rotating said motor, and a motor drive means for driving said motor by the pulse from said pulse generator means.

4,648,702

TONER DENSITY DETECTOR AND TONER SUPPLIER

Masahiro Goto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 20, 1983, Ser. No. 543,930
Claims priority, application Japan, Oct. 27, 1982, 57-187360; Oct. 27, 1982, 57-187361; Oct. 27, 1982, 57-187362
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 DD 14 Claims



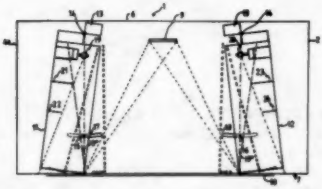
1. A toner density detecting device comprising:
means for detecting a toner density of a developer, said means including a conductive member for receiving a toner for density detection;
applying means for applying a bias voltage to said conductive member; and
resistor means provided between said conductive member and said applying means to suppress excessive current flow through said conductive member during toner density detection, said excessive current flow being caused by a breakdown of the developer.

4,648,703

DEVICE FOR EXPOSING AN EDGE ZONE OF A PHOTOCONDUCTIVE ELEMENT TO LIGHT

Wilhelmus T. J. Brugman, Venlo, Netherlands, assignor to Oce-Nederland B.V., Venlo, Netherlands

Filed Oct. 3, 1985, Ser. No. 783,940
Claims priority, application Netherlands, Oct. 10, 1984, 8403079
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 R 5 Claims



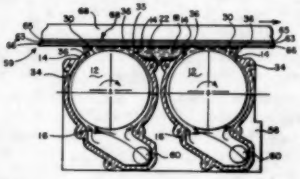
1. A device for exposing an edge zone of a photoconductive element to light comprising a housing and a light source mounted therein, the housing having on its side facing the photoconductive element an aperture in the form of a slit extending across an edge zone of the photoconductive element, and being pivotable in the direction of the length of the slit aperture such that the width of the edge zone that is exposed to light can be adjusted and wherein those parts of the photoconductive element which are situated outside the edge zone are screened against exposure to light from the light source, the light source being disposed in the housing in an area defined by two planes which intersect along the bottom edge of the innermost side wall of the housing and form an angle of 15° such that the plane through the pivot line of the housing and the bottom edge of the innermost side wall of the housing bisects the 15° angle.

4,648,704

METHOD AND APPARATUS FOR APPLYING LIQUID TONER TO A RECORDING MEMBER

Kevin J. O'Leary, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 29, 1985, Ser. No. 802,916
Int. Cl.[4] G03G *15/10*
U.S. Cl. 355—10 11 Claims



1. Apparatus for the application of liquid toner to the surface of an electrographic record bearing member comprising a platen support member for an electrographic record member and developing electrode spaced from said platen member to form a toning gap, said platen member and said developing electrode being movable with respect to each other said apparatus comprising:
said developing electrode including at least a pair of cylindrical rollers;
a shroud surrounding each of said rollers so as to define a space between each roller and its respective shroud;
each shroud having an opening therein permitting a portion of a roller to project beyond its respective shroud;
means for providing a continuous supply of liquid toner into the space around each roller and to force said liquid into the space around each roller and to force said liquid upward between the shroud and said roller;
collecting means extending between adjacent portions of said shrouds in which liquid toner is allowed to collect during operation;
said motion between said platen and the developing electrode allowing contact of said platen with the film of liquid toner above said rollers and with the collected toner between said shrouds.

4,648,705

CLEANING DEVICE

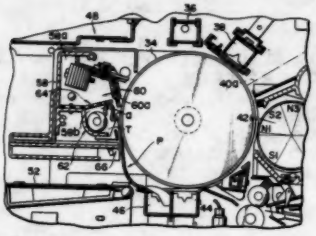
Natsuki Tachibana, Kamakura, and Issey Ichihara, Chiba, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 14, 1985, Ser. No. 733,795
Claims priority, application Japan, May 23, 1984, 59-104025
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—15 4 Claims

1. A cleaning device for removing residual developing agent from the surface of an image carrier, thereby cleaning the surface, after an image has been transferred from the image carrier to a sheet of paper, said device comprising:
a housing with an opening cut in one side opposing said image carrier;
a cleaning blade provided within said housing and contacting at one end the surface of the image carrier for scraping residual developing agent from the surface of the image carrier;
conveying means provided within said housing, below said

cleaning blade, for receiving the developing agent scraped from the image carrier and conveying the same to one side of said housing; and

means provided within said housing for preventing a sheet of paper from entering said housing, said sheet having been



carried by the image carrier to the cleaning device and then peeled by said cleaning blade from the image carrier, said preventing means including a shield dividing said housing into a first chamber in which said cleaning blade is held and a second chamber in which said conveying means is held.

4,648,706

IMAGE REPRODUCTION APPARATUS

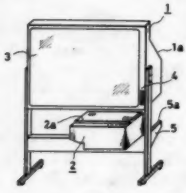
Sohei Shibasaki; Yasumasa Iwasaki; Noriki Ono; Koichi Arai; Koji Maruyama, and Tatsumi Shimanari, all of Higashiyamatoshi, Japan, assignors to Casio Computer Company, Ltd. and Casio Electronics Manufacturing Company, Ltd., both of Tokyo, Japan

Filed Oct. 15, 1985, Ser. No. 787,379

Claims priority, application Japan, Oct. 17, 1984, 59-216381; Oct. 22, 1984, 59-158429[U]; Oct. 29, 1984, 59-163497[U]; Dec. 25, 1984, 59-271696; Apr. 23, 1985, 60-61449[U]; Apr. 26, 1985, 60-63959[U]

Int. Cl.⁴ G03B *27/52, 27/70*

U.S. Cl. 355—43 **15 Claims**



1. In the image reproduction apparatus including a display section where a display member provided with a display surface on and from which images can be written and erased is arranged movable, and a copying section detachable from the display section and capable of selectively copying images on the display surface and those on originals on a table on which the originals are mounted, said image reproduction apparatus characterized in that said copying section has a means for moving between a first position where said copying section is engaged with the display section and a second position where it is released from the display section, and that the image written on the display surface is copied at the first position while the original is copied at the second position.

4,648,707

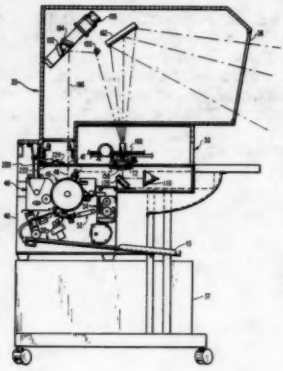
READER-PRINTER SYSTEM

Leo Tanasescu, Redondo Beach, Calif., assignor to Petro Fax, Inc., Casper, Wyo.

Filed Dec. 9, 1985, Ser. No. 806,539

Int. Cl.⁴ G03B *13/28, 27/32*

U.S. Cl. 355—45 **13 Claims**



1. A readout system comprising:

a source of illumination which is propagated along a predetermined path;

a medium carrying an image and disposed in said predetermined path;

an imaging screen located in the path of said illumination beyond said medium;

a projection lens system located with respect to said medium and adjustable to focus said image upon said screen;

an image storage element disposed in a discrete portion of the path of said illumination beyond said medium;

means for effectively moving said medium along a given path, movement of said medium sweeping a moving segment of said image across said screen and also presenting a moving section of said image in said discrete path to said storage element;

and means for operationally adjusting the length of said discrete path portion.

4,648,708

PATTERN TRANSFER APPARATUS

Masao Kosugi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1985, Ser. No. 707,826

Claims priority, application Japan, Mar. 8, 1984, 59-42818

Int. Cl.⁴ G03B *27/42, 27/52*

U.S. Cl. 355—53 **12 Claims**

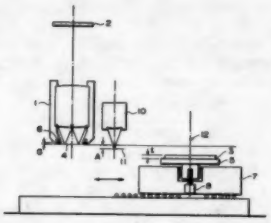
1. A pattern transfer apparatus for transferring a pattern onto a member, comprising:

optical means;

means for detecting a dimension variable in dependence upon the thickness of the member, said detecting means producing a detection signal; and

means for correcting the position of the member in the direction of the optical axis of said optical means in accor-

dance with the detection signal produced by said detecting means, said correcting means correcting the position



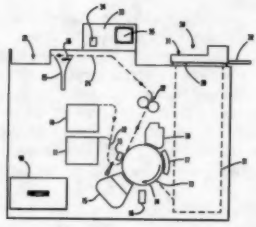
of the member when the member is between a station for said optical means and a station for said detecting means.

4,648,709

METHOD AND APPARATUS FOR PRODUCING TRANSPARENT FOIL COPIES

Kenneth A. Bushaw, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1985, Ser. No. 809,629
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—77 **35 Claims**



1. A method of using a copier to automatically produce two-sheet simplex copy sets of each sheet of a multi-sheet original document, one sheet of each set being a copy of an original document sheet's image which is produced on a sheet of blank transparent foil, and the other sheet of each set being a backup paper sheet, comprising the steps of:

A—selecting the production of foils, and as a result thereof setting said copier to produce at least one copy of each sheet of said original document, and to feed two copy sheets for each original document sheet;

B—providing a first and a second supply bin for sheets on which copies can be produced;

C—providing at least N number of blank foil sheets in said first supply bin;

D—providing at least N number of blank paper sheets in said second supply bin;

E—feeding an original document containing N sheets, one sheet at a time, to an imaging station for the purpose of copying the image contained thereon;

F—copying said image at least one time on a sheet of blank foil taken from said first supply bin; and

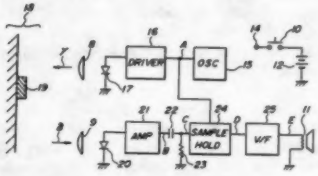
G—feeding a backup paper sheet from said second supply bin prior to copying another original document sheet.

4,648,710

BLIND GUIDE DEVICE

Itsuki Ban, 3-50-18 Higashi Oizumi, Nerima-ku; Toshiyuki Kii, 2-9-12 Nakane, Meguro-ku, and Yuji Mitsuta, 4-28-17 Shimo-Shakuji, Nerima-Ku, all of Tokyo, Japan

Filed Apr. 30, 1985, Ser. No. 728,932
Claims priority, application Japan, Jun. 13, 1984, 59-86676[U]
Int. Cl.[4] G01C *3/08*
U.S. Cl. 356—4 **6 Claims**



1. A blind guide device comprising

a light-emitting element,

a first electric circuit for generating an electric pulse and causing pulsating-conduction of said light-emitting element,

a first lens for converging the light emitted from said light-emitting element onto a body to be detected,

a mark attached to said body to be detected for performing retroreflection action,

a second lens and a photo-detector element for receiving the light reflected by said body to be detected and said mark,

a second electric circuit for amplifying the output electric signal of said photo-detector element and holding an electric signal synchronized with said electric pulse,

a V/F converter circuit for generating an electric signal of audible frequency whose frequency varies in response to the output electric signal of said second electric circuit, and

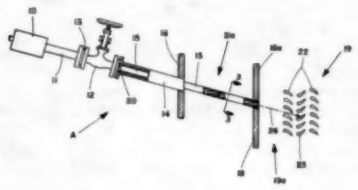
an electro-acoustic transducer for converting the output electric signal of said converter circuit into a sound.

4,648,711

SIGHT TUBE ASSEMBLY AND SENSING INSTRUMENT FOR CONTROLLING A GAS TURBINE

Richard E. Zachary, Clinton, La., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 618,658, Jun. 8, 1984, abandoned. This application May 2, 1985, Ser. No. 730,007
Int. Cl.[4] G01J *5/48, 5/60*
U.S. Cl. 356—44 **8 Claims**



1. In combination, a sight tube assembly and an optical pyrometer, for controlling the firing temperature of a gas turbine, which comprises:

an optical pyrometer unit that includes a first tubular member extending from the pyrometer unit, the first tubular member defining a coupler neck having an open end;

a valve having open and closed positions, the valve having a first end and a second end, the first end being connected to the open end of the pyrometer coupler neck;

a transparent member that serves as a sight glass, the sight

glass being positioned between the pyrometer coupler neck and the first end of the valve member;

a second tubular member that defines a nozzle, the nozzle having a first end fastened to a casing member of the turbine, the nozzle having a second end fastened to the second end of the valve;

a sight tube that fits inside the nozzle, the sight tube having a first end and a second end, the first end of the sight tube being positioned between the second end of the valve and the second end of the nozzle, the second end of the sight tube extending into the wall of a hot gas duct member on the turbine, and the outside diameter of the sight tube being smaller than the inside diameter of the nozzle, such that an annulus is defined between the sight tube and the nozzle; and

a turbine section in the gas turbine that includes several rows of stationary guide vanes and several rows of rotating turbine blades, the second end of the sight tube being positioned before the first row of stationary guide vanes, and the first row of stationary guide vanes being positioned before the first row of rotating turbine blades;

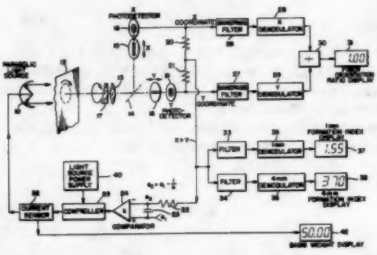
the optical pyrometer sight tube assembly being positioned in the gas turbine such that a line of sight passes directly from the pyrometer unit through the sight glass and the sight tube, and between a pair of adjacent guide vanes in the first row of stationary guide vanes, to impinge on a selected area of the first row of rotating turbine blades; wherein, when the valve is in its closed position, the sight glass and pyrometer unit are isolated from the environment of the turbine section.

4,648,712

APPARATUS AND METHOD FOR ANALYZING PARAMETERS OF A FIBROUS SUBSTRATE

Irving R. Brenholdt, Stratford, Conn., assignor to Champion International Corporation, Stamford, Conn.

Filed Feb. 4, 1985, Ser. No. 698,226
Int. Cl.[4] G01N *21/86*
U.S. Cl. 356—73 **22 Claims**



1. Apparatus for analyzing a fibrous substrate such as paper to evaluate the orientations of fibers therein comprising:

light source means for illuminating one side of a substrate to be analyzed;

first and second light detector means for detecting light from said light source which has passed through to the other side of the substrate and producing an output proportional to the light detected thereby;

means for limiting the field of view of said first light detector means to an elongated narrow strip along a first direction;

means for limiting the field of view of said second light detector means to an elongated narrow strip along a second direction;

means for jointly scanning the fields of view of said light detectors in a repetitive pattern traversing said first and second directions to cover an area on the substrate being analyzed;

means for filtering the output of said first detector to eliminate components thereof below a predetermined frequency;

means for filtering the output of said second detector to eliminate components thereof below a predetermined frequency; and

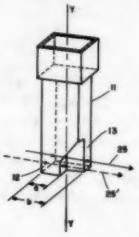
means for processing the filtered outputs of said detectors to produce a combined signal indicative of the ratio of fibers of said substrate oriented in said first direction to those oriented in said second direction.

4,648,713

METHOD AND CUVETTE FOR PHOTOMETRIC ANALYSIS

Claude Borer, and Kurt Schildknecht, both of Hünenberg, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 23, 1983, Ser. No. 565,246
Claims priority, application Switzerland, Dec. 29, 1982, 7611/82
Int. Cl.[4] G01N *1/10*
U.S. Cl. 356—246 **10 Claims**



5. A cuvette for the photometric analysis of a liquid sample in an automatic photometric analyzer wherein the cuvette is moved across a light beam while traveling in a circular path, comprising an elongated interior for retaining the liquid sample and which elongated interior defines at least two adjacent regions distributed over its width, which are suitable for carrying out the photometric analysis, each such region defining a sight passageway, and which sight passageways have different lengths changing from one region to the next in a stepwise manner, whereby as the cuvette is being moved through the light beam, the light beam passes through the respective sight passageways of said at least two adjacent regions in succession.

4,648,714

MOLECULAR GAS ANALYSIS BY RAMAN SCATTERING IN INTRACAVITY LASER CONFIGURATION

Robert E. Benner; Joseph D. Andrade; Richard A. Van Wagenen, and Dwayne R. Westenskow, all of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Filed Sep. 11, 1985, Ser. No. 774,643
Int. Cl.[4] G01J *3/44*
U.S. Cl. 356—301 **20 Claims**

1. A system for the near simultaneous analysis and quantitation of selected multiple polyatomic gases in a gas sample by Raman light scattering comprising in combination;

(a) laser means capable of producing a polarized laser beam of a selected wavelength containing a laser cavity said laser cavity containing a plasma tube and wherein one end of said laser cavity contains a high reflectivity output coupler mirror;

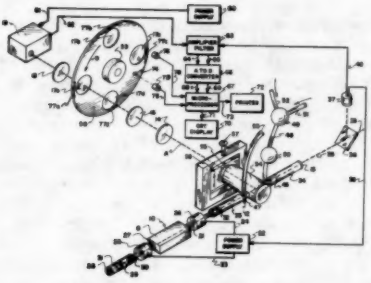
(b) a gas sampling cell located within said laser cavity between said plasma tube and said output coupler mirror, said cell having opposing parallel end windows interconnected by a continuous sidewall, said end windows and sidewall defining a longitudinal gas chamber oriented such that, when said laser beam is activated, the laser beam is coincident with and traverses the axis of said

longitudinal gas chamber, said end windows being positioned to be substantially normal to the axis of the longitudinal gas cell chamber, said cell also having opposing, aligned side windows in said sidewall parallel to and on either side of the axis of said longitudinal gas chamber, said gas cell further containing inlet and outlet means communicating with said chamber to pass a sample gas through said cell;

(c) a reflection mirror positioned adjacent to and outside of said gas cell parallel to and in alignment with said side windows on one side thereof to capture and redirect a proportion of scattered elastic laser light and inelastic Raman light through said side windows,

(d) collection lens means positioned parallel to and in alignment with said side windows outside said gas cell and on the side opposite from said reflection mirror to collect elastic laser scattered light and inelastic Raman light passing through said side windows,

(e) laser line rejection filter means positioned to receive the scattered light passing through said collection lens means, said filter being selected to reject elastic laser scattered light passing through said collection lens means while allowing the transmission of inelastic Raman scattered light,



(f) a rotatable filter wheel containing a series of interference filters wherein each interference filter is selected to transmit only a single Raman spectra line of a predetermined wavelength, said filter wheel being positioned such that, as it rotates, each interference filter will sequentially receive Raman scattered light passing through said laser line rejection filter means;

(g) detection and amplification means for sequentially receiving Raman line signals passing through each of said interference filters and converting said signals to digital electrical pulses;

(h) processing means for intrepreting said digital electrical pulses and converting them to visual readouts indicative of the concentration of each of said selected polyatomic molecular gases in said sample; and

(i) power means to operate said laser means, rotating filter wheel, detection and amplification means and processing means.

4,648,715

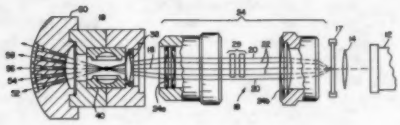
ELECTROPHORETIC LIGHT SCATTERING WITH PLURAL REFERENCE BEAMS, APPARATUS AND METHOD

Norman C. Ford, Jr., Amherst, Mass., and Bennie R. Ware, Marietta, N.Y., assignors to Langley-Ford Instruments a division of Coulter Electronics of N.E., Amherst, Mass.

Continuation-in-part of Ser. No. 415,581, Sep. 7, 1982. This application Mar. 23, 1984, Ser. No. 592,829

Int. Cl.[4] G01N *21/00*

U.S. Cl. 356—344 **10 Claims**



1. A process for the electrophoretic characterization of fluid-dispersed particles by measurement of electrophoretic light scattering from said particles, said process comprising the steps of

(a) generating a light pattern, incident on said particles dispersed within an electrophoretic cell, which light pattern is characterized by (1) a relatively strong beam forming a principal source of scattered light and (2) a plurality of local oscillator beams of relatively low intensity compared to said strong beam, each of said relatively-low intensity beams being incident on said particles at angles different from each other and different from said strong beam,

(b) directing said beams of relatively low intensity light, at a variety of angles, into a sample cell wherein the particles to be characterized are subjected to an electrophoretic environment, thence directing light from said cell onto detectors mounted at a plurality of angles around said cell;

(c) detecting and measuring, in each detector, a light from one of said plurality of local oscillator beams and light scattered from said strong beam by said particles within said cell at a plurality of angles, as said light leaves said cell, and

(d) simultaneously evaluating light scattered at each said angle to distinguish electrophoretic characteristics of said dispersed particles from random diffusion characteristics of said particles.

4,648,716

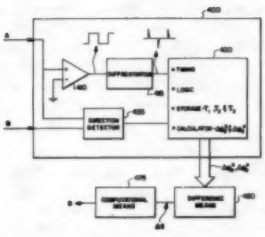
DISCRIMINANT APPARATUS FOR A RING LASER ANGULAR RATE SENSOR

Werner H. Egli, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 22, 1982, Ser. No. 421,598

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—350 **14 Claims**



1. An apparatus for providing a discriminant signal indicative of lock-in rate of a ring laser angular rate sensor of the class wherein two waves propagate in opposite directions

along a closed-loop path, wherein the frequency of each of said waves is a function of the rate of rotation of said closed-loop path, there being a time varying phase difference therebetween, in the presence of rotation, and wherein said sensor provides an output signal indicative of the rotation of said closed-loop path, the apparatus comprising:

biasing means for affecting the frequency of at least one of said waves to alternate the sign of the frequency difference between said waves;

signal means responsive to said waves for providing at least one output signal related to said phase difference between said waves;

phase angle determining means for determining first and second zero rate crossing phase values of said phase difference at occurrences of selected zero rate crossings of said phase difference, said zero rate phase angle determining means includes,

means for determining said first phase value as a function of the behavior of said phase difference before a zero rate crossing, and

means for determining said second phase value as a function of the behavior of said phase difference after a zero rate crossing, and

difference means for determining a difference value between said first and second phase values;

means for determining a historical variation of said difference value as a function of said difference values of a plurality of zero rate crossing occurrences to produce said discriminance signal indicative of said lock-in rate.

4,648,717

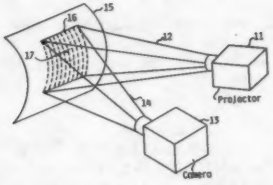
METHOD OF THREE-DIMENSIONAL MEASUREMENT WITH FEW PROJECTED PATTERNS

Joseph Ross, Ft. Salonga, and Richard Schmidt, Huntington, both of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Division of Ser. No. 577,331, Feb. 6, 1984. This application Nov. 4, 1985, Ser. No. 794,613

Int. Cl.⁴ G01B *11/24*

U.S. Cl. 356—376 **5 Claims**



1. A method for resolving ambiguity of a periodic pattern projected upon a surface to be measured in two or three dimensions comprising the steps of: projecting a periodic radiation pattern on a surface and obtaining a first reflected pattern; recording an image of said first reflected pattern; projecting one period of said periodic radiation pattern upon said surface and obtaining a second reflected pattern; recording an image of said second reflected pattern; identifying said one period image as a reference image; and identifying each period image sequentially in the periodic image relative to the reference image.

4,648,718

OPTICAL MEASURING SYSTEM

Nishihara Sadamitsu, Tokyo, and Kawahara Yuji, Saitama, both of Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

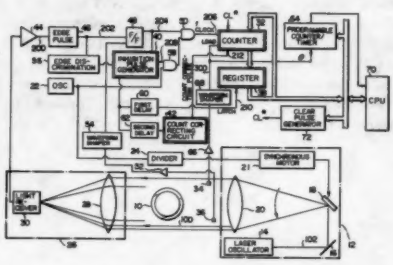
Filed Jul. 22, 1985, Ser. No. 757,736

Claims priority, application Japan, Jul. 26, 1984, 59-156997

Int. Cl.⁴ G01B *11/08*

U.S. Cl. 356—387 **2 Claims**

1. An optical measuring apparatus comprising a light scanning section for illuminating an object to be measured with parallel scanning and measuring rays, a photodetector section for detecting changes of intensity in said parallel scanning and measuring rays passed through said object to generate photodetection output signals, and a counter for counting clock pulses during the scanning of said rays, the length of said object being determined based on the counted value obtained in said counter while said parallel scanning and measuring rays is moving along the length of said object, said apparatus being characterized in that said counter is adapted to initiate its counting operation for the clock pulses as said parallel scanning and measuring rays pass over the start end of said object; and in that said apparatus further comprises a temporal inhibition circuit for inhibiting the counting operation of said



counter for a period of time in response to either of false detection signals created from said parallel scanning and measuring rays passed through said object after the initiation of said counting operation or a detection signal indicative of the finish end of said object, a register for latching the output of said counter during the period of inhibition and also after the output of said counter has been stabilized, a correcting circuit for adding a correction value corresponding to said period of inhibition to said counter during the counting operation and also after said latching operation has been terminated, all the false detection signals created while the parallel scanning and measuring rays are passing over said object being discarded to effect a proper measurement based on clock pulses counted between the start and finish ends of said object.

4,648,719

COLLOIDER FOR COLLOIDIZING FLOWABLE MATERIALS

Wilhelm Röben, Zetel, Fed. Rep. of Germany, assignor to Roben Kolloid Entwicklung GmbH & Co. KG., Zetel, Fed. Rep. of Germany

Filed Apr. 30, 1985, Ser. No. 728,750

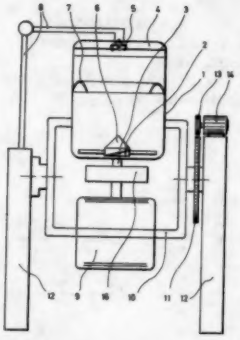
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1985, 3502153

Int. Cl.⁴ B01F *3/12*

U.S. Cl. 366—143 **32 Claims**

1. A colloider for colloidizing flowable materials comprising a collection tank, a top area of which is suitably designed for receiving the materials and a rotor which is rotatably mounted on a drive shaft in a bottom area of the collecting tank and acts as an influence means, a plurality of vanes fastened to said rotor, the drive shaft of the rotor exending outwardly through the bottom of the collecting tank, said collecting tank including an opening closeable by a cover and being located in the top area of said tank, said colloider being selectively movable into an operating position, in which said opening is at the top, and into a draining position, in which said opening is at the bottom, the improvement comprising in that the ratio of the

inner diameter of said collecting tank to the diameter of said rotor ranges from 1.10 to 2.25 in that the ratio of the diameter



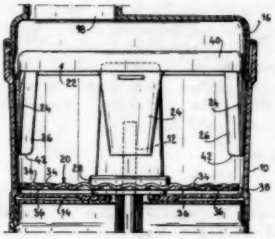
of said collecting tank to the distance between the vanes and the tank bottom ranges from 4 to 25.

4,648,720

BEATING/EMULSIFYING TOOL FOR A DOMESTIC ELECTRICAL APPLIANCE FOR FOOD PREPARATION

Jean-Pierre Trocherie, Villaines-la-Jubel, France, assignor to Moulinex Societe Anonyme, Bagnolet, France

Filed May 29, 1985, Ser. No. 739,603
Claims priority, application France, Jan. 29, 1985, 85 01209
Int. Cl.[4] B01F *7/26*
U.S. Cl. 366—306 **5 Claims**



1. An electrical food preparation appliance which comprises a bowl generally cylindrical in shape with a substantially vertical axis, a substantially vertical shaft rotatably mounted in said bowl, a beating/emulsifying tool comprising a disc having a substantially vertical axis, said disc extending near to the bottom of the bowl and being rotatable by way of said vertical shaft, said disc having, on at least one of its upper and lower faces, a series of radially directed projections, and a cylindrical cage having an annular reinforcement which is removably engaged with the bowl, and which is coaxial relative to said bowl, and a series of vertical bars integral with said reinforcement and forming on the inner wall of the bowl a series of vertical ribs directed radially inwardly.

4,648,721

QUICKLY RESETTABLE TIMER

Edward Shapiro, 421 Clair Dr., Upper St. Clair, Pa. 15241

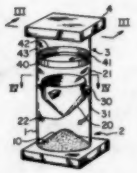
Filed Jun. 24, 1985, Ser. No. 747,857
Int. Cl.[4] G04F *1/04*
U.S. Cl. 368—93 **15 Claims**

1. A quickly resettable timer which comprises:

a container defining a chamber having a base end and a reset end opposite the base end;

a quantity of a flowing, solid particulate medium container within the chamber;

a funnel-like receptacle having a loading orifice nearest the reset end and a metered orifice nearest the base end for restricting the flow of the particulate medium through the receptacle, said receptacle being mounted to and spaced from an interior wall section of the container intermediate



the base end and the reset end such that the particulate medium in the base end flows over and around the receptacle and into the reset end upon inversion of the container by rotation in any direction; and

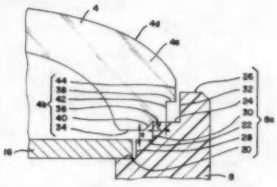
means for channeling the particulate medium into the reset end of the chamber upon inversion and from the reset end of the chamber, through the loading orifice and into the receptacle upon righting of the container by rotation in any direction.

4,648,722

PLASTIC WATCH CASING WITH PLASTIC CRYSTAL AND PROCESS FOR JOINING THE CRYSTAL TO THE CASING

Elmar Mock, Perry, and Jacques Müller, Reconvilier, both of Switzerland, assignors to ETA S.A., Fabriques d'Ebauches, Granges, Switzerland

Division of Ser. No. 522,779, Aug. 12, 1983, Pat. No. 4,558,957.
This application Sep. 20, 1985, Ser. No. 778,038
The portion of the term of this patent subsequent to Dec. 17, 2002, has been disclaimed.
Int. Cl.[4] G04B *37/00*
U.S. Cl. 368—294 **6 Claims**



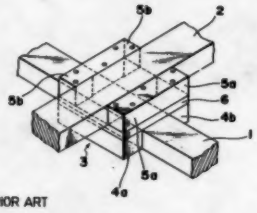
1. A watch comprising a casing, a crystal closing said casing and, within said casing, a movement and a dial, wherein said casing is made of a thermo-weldable synthetic material and comprises an abutment face, said crystal is made of a material which is thermo-weldable to the material forming said casing and comprises an abutment face, and the crystal is secured to said casing solely by a thermo-weld comprising a fused mixture of the materials of both said crystal and said casing, said dial being locked between said abutment faces so as to mount said dial directly on said casing beneath said crystal.

4,648,723

STATIC PRESSURE AIR SURFACE STAGE

Sadao Sugiyama, Shiga, and Hiroshi Goto, Suita, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jul. 18, 1985, Ser. No. 756,118
Claims priority, application Japan, Jul. 23, 1984, 59-153676
Int. Cl.[4] F16C *17/26, 32/06*
U.S. Cl. 384—9 1 Claim



PRIOR ART

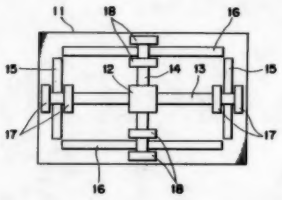
1. A static pressure air surface stage comprising:
a base;
a first movable guide capable of movement in one linear direction on said base;
a second movable guide capable of movement in a second linear direction on said base perpendicular to said first direction;
two bearing pads located on each side of said first movable guide, two of the bearing pads located on one side of the first movable guide being integrally formed; and
two bearing pads located on each side of said second movable guide, two of the bearing pads located on one side of the second movable guide being integrally formed;
wherein the integrally formed bearing pads located on one side of the first movable guide are integrally formed with the integrally formed bearing pads located on one side of the second movable guide.

4,648,724

STATIC PRESSURE AIR SURFACE STAGE

Sadao Sugiyama, Shiga, and Hiroshi Goto, Suita, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jul. 18, 1985, Ser. No. 756,103
Claims priority, application Japan, Jul. 20, 1984, 59-151549
Int. Cl.[4] F16C *17/26, 32/06*
U.S. Cl. 384—9 1 Claim



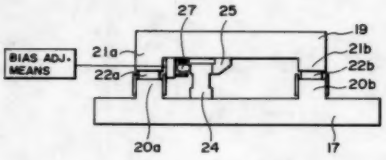
1. A static pressure air surface stage comprising:
a surface plate;
stationary guides fixedly mounted on the surface plate, each stationary guide having two opposed substantially vertical faces; and
a stage slideably mounted on movable guides, each of said movable guides having a pair of bearing pads fixedly attached to at least one end thereof;
wherein one pad of each pair of bearing pads is diametrically disposed to the other pad of said pair on said opposed faces of one of said stationary guides.

4,648,725

GUIDE MECHANISM

Kazuo Takahashi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 30, 1985, Ser. No. 771,300
Claims priority, application Japan, Sep. 4, 1984, 59-183803
Int. Cl.[4] F16C *29/02, 29/04*
U.S. Cl. 384—9 9 Claims



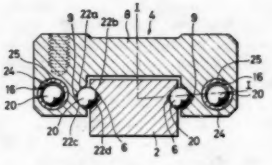
1. A device for guiding movement of a first member relative to a second member, said device comprising:
first means for allowing the movement of said first member relative to said second member in a predetermined direction and for prohibiting displacement of said first member relative to said second member in a first direction which is perpendicular to said predetermined direction, said first means having a rollable element disposed between said first and second members so that said rollable element is rollable in said predetermined direction; and
second means for prohibiting displacement of said first member relative to said second member in a second direction which is perpendicular to said predetermined direction and to said first direction, said second means having a slidable element for providing sliding friction against relative movement between said first and second members in said predetermined direction; and
means for adjusting the sliding friction provided by said slidable element without affecting rolling of said rollable element of said first means.

4,648,726

LINEAR GUIDE DEVICE

Masayuki Katahira, Maebashi, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1985, Ser. No. 796,784
Claims priority, application Japan, Dec. 8, 1984, 59-259460
Int. Cl.[4] F16C *29/06*
U.S. Cl. 384—45 7 Claims



1. A linear guide device comprising: a long rail having grooves formed axially thereof;
a carriage including a saddle-shaped body having grooves proximate and opposed to said grooves of said rail, and a pair of end caps mounted respectively on the opposite ends of said body; and
a number of balls rolling in a plurality of circulation paths formed by said rail and said carriage;

each said circulation path including:

a guide passageway formed by one of the grooves of said rail and one of the grooves of said body;

a ball return passageway provided in said body in juxtaposed relationship with said guide passageway; and

a set of curved passageways formed in said end caps to connect said guide passageway to said return passageway:

said return passage having a pipe forced into a throughhole extending through said body;

each said pipe having a chamfered end portion which engages a corresponding projection of the end cap at one end of said body, whereby that end cap may be precisely positioned on said body.

4,648,727

ANTIFRICTION BEARING ASSEMBLY FOR A DIE SET OR THE LIKE

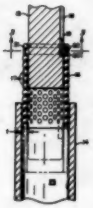
Junior O'Neil, Somerset, and Leonard D. Plagens, Broadview Heights, both of Ohio, assignors to Lempco Industries, Inc., Cleveland, Ohio

PCT No. PCT/US84/01271, § 371 Date Mar. 25, 1985, § 102(e) Date Mar. 25, 1985

Continuation-in-part of Ser. No. 552,830, Nov. 17, 1983, abandoned. This PCT application Aug. 13, 1984, Ser. No. 717,226

Int. Cl.[4] F16C *29/04*

U.S. Cl. 384—49 **4 Claims**



1. In a ball bearing assembly which includes relatively reciprocable and telescoping shaft and bushing members and a tubular, cylindrical ball bearing retainer arranged to telescope between said members; that improvement which comprises:

(a) an annular, circumferential groove formed in said bearing retainer and opening toward one of said shaft and bushing members;

(b) an axially directed guideway formed in said last-named member adjacent said bearing retainer and terminating a distance inwardly from an end of said last-named member; and

(c) key means slidable within the circumferential groove of said retainer and extending into the guideway of said last-named member and connecting said bearing retainer to said last-named member for relative axial reciprocation and rotation, said key means comprising a slide movable within said guideway and having thereon a projection which extends radially into and is slidable within the circumferential groove formed in said retainer.

4,648,728

STEERING COLUMN SWITCH FOR MOTOR VEHICLES

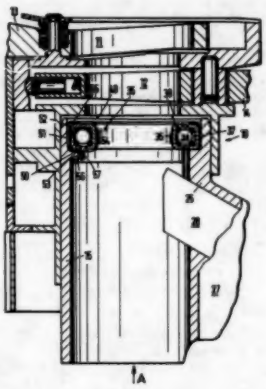
Herbert Erdelitsch, Bietigheim-Bissingen; Werner Gaudich, Ingersheim, and Walter Hecht, Bietigheim-Bissingem, all of Fed. Rep. of Germany, assignors to SWF Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

Filed Jul. 17, 1985, Ser. No. 755,924

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1984, 3426606

Int. Cl.[4] F16C *35/077*

U.S. Cl. 384—537 **10 Claims**



1. A steering column switch for motor vehicles, comprising:

a support sleeve of plastic material which maybe mounted on the end of a steering tube;

an internal collar integrally formed on said sleeve and extending radially inward;

a retaining ring formed separately from said support sleeve and disposed within said support sleeve said retaining ring engaging said internal collar whereby said internal collar prevents axial movement of said retaining ring in both directions along the axis of said sleeve, and

a rolling bearing for a steering spindle, said bearing being mounted within said sleeve and retained between said collar and one end of said retaining ring.

4,648,729

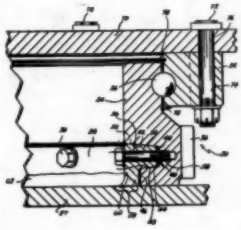
BEARING WELD RING

J. Ivor Jones, Sumter, S.C., assignor to Kaydon Corporation, Muskegon, Mich.

Filed May 28, 1985, Ser. No. 737,888

Int. Cl.[4] F16C *19/16, 33/58*

U.S. Cl. 384—615 **10 Claims**



1. A bearing mount comprising:

a first bearing ring;

rolling members disposed at said first bearing ring;

a second bearing ring, said second bearing ring mating with said first bearing ring and said rolling members;

at least one of said first bearing ring and said second bearing ring having a composition such that said one bearing ring is not readily weldable without damaging said one bearing ring;

a bearing securing element having means for securing to said one bearing ring, said bearing securing element having a composition that is readily weldable to a support without requiring securing bolts between said bearing securing element and said support, whereby said bearing is provided with the ability to be weld-mounted to said support;

said one bearing ring including an annular recess about a perimeter thereof;

said bearing securing element including a radially extending lip received in said annular recess, and said securing element includes a portion disposed adjacent said support to facilitate welding thereto;

both said annular recess and said radially extending lip having at least one mating, tapered engagement surface; and

said lip having an extending length and said annular recess having a depth greater than the extending length of said lip, whereby spacing is provided between the end of said lip and a wall of said annular recess.

4,648,730

ARMATURE GROUP FOR MOSAIC PRINTING HEAD AND RELATED MANUFACTURING METHOD

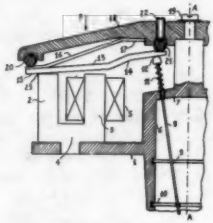
Sergio Cattaneo, Milan, Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy

Continuation of Ser. No. 664,134, Oct. 24, 1984, abandoned. This application Mar. 18, 1986, Ser. No. 841,066

Claims priority, application Italy, Nov. 23, 1983, 23833 A/83

Int. Cl.[4] B41J *3/12*

U.S. Cl. 400—124 **5 Claims**



1. An armature group for a mosaic printing head comprising:

a plurality of printing needles, each needle having a head for receiving an actuation force driving said head and said needle in a direction of the axis of said needle;

an electromagnetic group consisting of a plurality of actuation electromagnets radially arranged about an axis through said head, each of said electromagnets including a radially protruding armature having a surface defining a first armature plane being rotatable about a fulcrum axis established by said electromagnet on said first armature plane and having a thrust arm for applying said actuating force for axially driving said head of a differnt one of said printing needles associated therewith;

an armature retainer being associated with said electromagnetic group, said retainer including means for defining the rest position for each electromagnet armature; and

a resilient annular element positioned on said armature retainer, said element having a plurality of elastic radially protruding arms, each armature being restrained to one end of a different one of said plurality of arms for ensuring correct radial positioning of the armature restrained thereto and permitting movement of said armature in the direction of actuation and said thrust arm of said each armature having a double bend defining a second plane of said thrust arm in contact with said head of said different one of said needles associated therewith, said second plane being non-coplanar with said first plane and intersecting said first plane at said fulcrum axis, said second plane being perpendicular to said axis of said needle when said armature is positioned in one of a number of possible positions, minimizing the effect of buckling forces during the travel of said needle.

4,648,731

ERROR CORRECTION MEMBER POSITIONING SYSTEM FOR A PRINTER

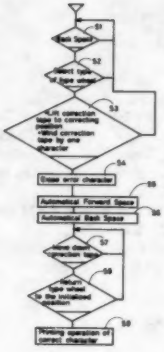
Hiroji Iwai, Yamatokoriyama, and Koji Yamaji, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 27, 1985, Ser. No. 706,082

Claims priority, application Japan, Feb. 27, 1984, 59-37167

Int. Cl.[4] B41J *35/10*

U.S. Cl. 400—240.1 **3 Claims**



1. In an impact printer apparatus for printing selected type characters on a recording medium by impacting selected type character elements against the recording medium through an inked ribbon at a strike position, the type character elements being mounted on a carriage movable horizontally with respect to the recording medium, error correction means for erasing errors in typed characters printed on the recording medium including an error correcting tape extending along the direction of carriage movement horizontally of the recording medium between spaced tension rollers, the improvement comprising:

(a) means for transversely moving the correcting tape and associated tension rollers from a storage position vertically below the strike position on the recording medium at which a type character error exists, into vertical alignment therewith;

(b) means for impacting a selected character type element against the error correcting tape to erase the error on the recording medium;

(c) means for longitudinally moving the error correcting tape horizontally of the recording medium after the error has been erased while precluding vertical movement of the tape so as to separate the correcting tape from the recording medium, said means for longitudinally moving said error correcting tape first moving said tape in a forward printing direction and then moving said tape in a back space direction; and

(d) means for transversely returning the correcting tape and associated tension rollers in a downward direction vertically of the recording medium to the storage position.

4,648,732

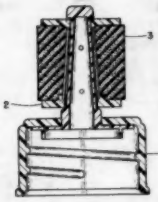
APPLICATOR FOR DISPENSING FLUIDS

Zozislaus Smialkowski, 303 No. Union Ave., Cranford, N.J. 07016

Continuation-in-part of Ser. No. 650,447, Sep. 14, 1984, abandoned. This application Jul. 24, 1985, Ser. No. 758,549

Int. Cl.⁴ B05C *17/02, 1/10*

U.S. Cl. 401—196 **8 Claims**



1. An applicator for dispensing small amounts of fluid which comprises a first inner cylindrical body provided with a top portion and a bottom portion (8) and at least one side opening (6), means on said body for connecting with a fluid dispensing device at one end thereof, a second outer cylindrical body in tight contact with said first cylindrical body at one point (12) in proximity of said top portion and at another point (21) in proximity of the bottom portion of said first cylindrical body, said second cylindrical body comprising a plurality of ribs (23), orifices between the ribs (26), two solid ledges (18, 19) holding the ribs at the upper and lower end thereof, an upper and a lower overhang member (16, 17), an absorbing element held between said overhang members, a closure member on said first cylindrical body at the top portion opposite to said means for connecting with the fluid dispensing device, said closure member comprising a cap (9), said second cylindrical member having a ledge (14) at the top thereof, said cap having an inner diameter, said ledge having a diameter smaller than the diameter of said cap, whereby said ledge is adapted to snap in the interior of said cap, said first cylindrical body being tapered at the top thereof.

4,648,733

DEVICE FOR PRODUCING AN INSTALLATION TEMPLATE FOR CONDUITS, ESPECIALLY CONDUITS FOR HYDRAULIC OR PNEUMATIC CONTROL OR PROCESS CIRCUITS

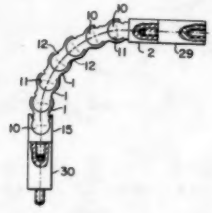
Robert Merkt, Am Sportplatz, 5441 Bell, Fed. Rep. of Germany

Filed Jul. 12, 1985, Ser. No. 754,519

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1984, 3426024

Int. Cl.⁴ F16C *11/06*

U.S. Cl. 403—56 **9 Claims**



1. A device to simplify assembly of even complex conduit systems for pressure-medium-driven switching or operating circuits for producing an installation template for conduits employed to arrive at precise measurement of length of said conduits and also to permit marking of conduit sections to be bent to a specific shape in motor vehicle industry as well as for processing and working machinery of various kinds, comprising:

a plurality of interconnectable articulated elements, each of which is relatively short compared to the length of said template; adjacent ones of said articulated elements can be respectively moved, relative to one another, about a common geometrical point of rotation and within a predetermined spatial angle;, said articulated elements can be fixed in any position relative to one another by clamping;

end pieces which are respectively connectable to given ones of said articulated elements; in addition, each of said end pieces is provided with connecting means on a side thereof remote from said articulated elements, with said given ones of said articulated elements each having a planar abutment surface for engagement with said end pieces; and

rod elements, each of which has a length that is several times greater than its diameter; each of said rod elements is provided with connecting means for cooperating with said connecting means of said end pieces so that said articulated elements can be kept in position to conform to various installation requirements although readily adaptable different configurations of employment undertaken therewith.

4,648,734

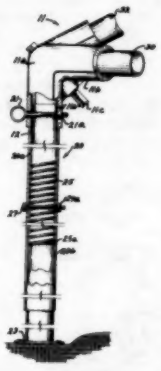
CORNER CONNECTOR ASSEMBLY

John J. Daus, Jr., and Henry E. James, both of Evansville, Ind., assignors to Anchor Industries, Inc., Evansville, Ind.

Division of Ser. No. 446,372, Dec. 2, 1982. This application Oct. 5, 1984, Ser. No. 641,710

Int. Cl.⁴ F16B *7/18*

U.S. Cl. 403—170 **1 Claim**

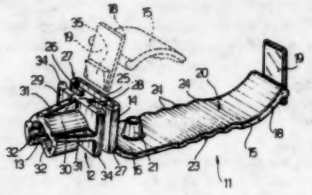


1. In combination with a two-part corner connector assembly defined as an outer member and an inner member, said outer member and said inner member each arranged to include arm portions at least one of which is vertically disposed, a tubular frame member defined as a leg interconnecting said vertically disposed arm portion, said tubular frame member including a first tubular member movable with respect to a second tubular member, said second tubular member supported on a receiving surface and seating a spring on its upper end which extends within said first tubular member, means securing said spring to said upper end of said second tubular member, and an elongated transverse member mounted on said first tubular member and extending across such between turns of said spring to selectively position said first tubular member and said two-part corner connector with respect to said receiving surface upon rotation of said first tubular member.

4,648,735
DEVICE FOR CONNECTING AN UPHOLSTERY STRENGTHENING ROD TO A SEAT LOAD-BEARING STRUCTURE

Manrico Oddenino, Buttigliera Alta, Italy, assignor to ITW Fastex Italia S.p.A., Turin, Italy

Filed Mar. 22, 1985, Ser. No. 715,232
Claims priority, application Italy, Apr. 2, 1984, 67319 A/84
Int. Cl.[4] F16B 7/00, 9/00
U.S. Cl. 403—187 9 Claims



1. A fastening device for connecting a rod to a structural member comprising:

retaining means for engaging, seating and locking an end of said rod;

buckle means integral with said retaining means on one side thereof;

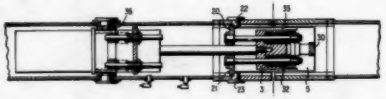
flexible clamp means for affixing said device to said structural member having a first end integral with said buckle means and a second end having an integrally formed tab for engagement with said buckle means; and

means for engaging integral with said flexible clamp means for securing said fastening device to said structural member having a truncated cone pin integrally formed with said clamp means projecting outwardly from one side thereof for insertion into an aperture of said structural member upon the wrapping of said clamp means around said structural member to secure said fastening device thereto.

4,648,736
RELEASABLE COUPLER, PARTICULARLY FOR GRIPPER RAILS IN A TRANSFER PRESS

Erich Harsch, Weingarten, and Reiner Reichenbach, Unteranken reute, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Müller-Weingarten AG, Weingarten, Fed. Rep. of Germany

Filed Oct. 1, 1985, Ser. No. 782,608
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1984, 3436075
Int. Cl.[4] F16B 7/00; B21J 13/08
U.S. Cl. 403—297 6 Claims

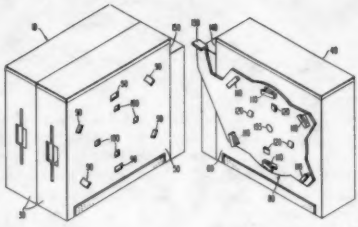


1. In a releasable coupling for connecting a first and a second component to one another, including a first sleeve-like hollow member affixed to an end of the first component and a second sleeve-like hollow member affixed to an end of the second component, an expander mandrel supported in said first hollow member and arranged for an axial motion with respect to said first hollow member to assume an advanced position in which it projects partially into said second hollow member to be surrounded simultaneously by said first and second hollow members; said expander mandrel including an expander element and pressing elements operatively connected to said expander element for displacement generally radially outwardly by said expander element into an expanded position for a simultaneous engagement with said first and second hollow elements thereby securing said first and second components to one another; and power means for axially displacing said expander mandrel and for displacing said expander element relative to said pressing elements; the improvement wherein each pressing element has a toothed outer face and each hollow member has a toothed inner face; in said advanced position of said expander mandrel and in said expanded position of said pressing elements each toothed outer face being in a meshing engagement with both toothed inner faces.

4,648,737
THEFT PREVENTION APPARATUS

Ralph J. Lake, Jr., Somerville, and Thomas P. Iosso, Middlesex, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 24, 1985, Ser. No. 748,194
Int. Cl.[4] F16B 21/00; H01R 13/62
U.S. Cl. 403—322 30 Claims



1. A coupling arrangement comprising:

a first assembly;

a first plate having apertures therethrough, forming an end wall of said first assembly;

a second assembly;

a rotatable coupling plate forming an end wall of said second assembly;

securing means on said coupling plate for rotatably securing said coupling plate to said first plate whereby said first and second assemblies are coupled together;

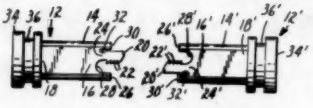
locking means for locking together said first and second assemblies after they have been coupled together, said locking means further preventing rotation of said coupling plate while said locking means is in place, whereby said first and second assemblies may not be uncoupled while said locking means is in place; and

wherein said locking means comprises two brackets coupled one to each of said assemblies and a lock securing together said brackets.

4,648,738
LOCKING PIN

James E. Thielen, New Brighton, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 551,293, Nov. 14, 1983, abandoned. This application Jun. 14, 1985, Ser. No. 744,932
Int. Cl.[4] F16B 1/00; F16D 3/00
U.S. Cl. 403—341 13 Claims



1. A first coupling unit capable of engaging a second coupling unit to form a locking pin, said first coupling unit comprising

(A) a post member having two ends;

(B) at one end of which post member is a head;

(C) at the other end of which post member is

(1) a first elongated member projecting from said post member, said first elongated member having a plurality of teeth thereon, which teeth are capable of engaging with like teeth on a first elongated member on a second

coupling when two coupling units are engaged to form said locking pin, said first elongated members being capable of flexing so that two coupling units can be engaged in a bore to form said locking pin, and

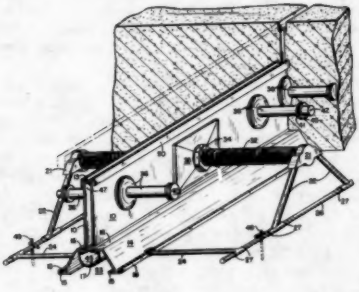
(2) a second elongated member projecting from said post member, said second elongated member being of sufficient length to prevent said engaged teeth on the first elongated members of engaged coupling units from disengaging, said second elongated member being positioned on said post member so that there is a cavity between said second elongated member and said first elongated member, said cavity capable of accommodating the first elongated member from said second coupling unit.

4,648,739

LOAD TRANSFER CELL ASSEMBLY FOR CONCRETE PAVEMENT TRANSVERSE JOINTS

Bernard D. Thomsen, 117 S. Mayfair Dr., Mankato, Minn. 56001

Filed Mar. 20, 1985, Ser. No. 713,810
Int. Cl.[4] E01C *11/02*; E01F *5/00*
U.S. Cl. 404—2 **20 Claims**



1. A load transfer cell assembly for concrete structure comprising:

(a) elongated liner means for disposition between adjacent end portions of end to end concrete slabs;

(b) said liner means including a pair of panels each extending vertically in a single plane and defining an open cell therebetween and being spaced apart in substantially parallel relation such that a plurality of compressible block may be inserted therebetween;

(c) said liner means further including gutter means extending longitudinally between said vertically extending panels and therebetween in position to collect and drain away fluid which may pass downwardly therebetween;

(d) plurality of compressible and resilient blocks disposed between said vertically extending panels throughout the portions thereof intermediate the ends of said panels in spaced apart relation so as to provide vertical drainage openings therebetween to allow fluid to pass to said gutter means;

(e) means for securing said liner means to a load transferring dowel bar assembly of such concrete slabs; and

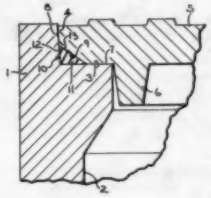
(f) mechanical compression means engaging opposite sides of said compression blocks and holding the same under compression therebetween at all times, said compression means being constructed and arranged to extend between adjacent ends of such concrete slabs and to be rigidly secured thereto whereby a load carried by one of such slabs will be transferred in part of least through said compression means and said compression blocks to the other of such slabs.

4,648,740

MANHOLE LID SEAL

Franklin J. Carlson, W36854 Cherokee Rd., Oconomowoc, Wis. 53066

Filed Mar. 3, 1986, Ser. No. 835,370
Int. Cl.[4] E02D *29/14*
U.S. Cl. 404—25 **5 Claims**



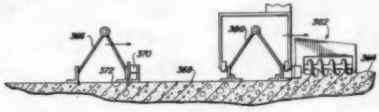
1. A manhole assembly, comprising an annular frame defining a manhole and having an upwardly facing ledge and having an annular surface bordering the outer extremity of said ledge, a lid to enclose the manhole and having a lower surface to seat directly on said ledge and having an outer peripheral surface abutting said annular surface, said lid also having an angular surface connecting said lower surface and said outer peripheral surface and disposed at an acute angle with respect to the horizontal, and an annular gasket for sealing the lid to said frame, said gasket being generally triangular in cross section and including a first surface resting on said ledge, a second surface disposed in contact with said annular surface of said frame and a third diagonal surface connecting said first and second surfaces, said third surface disposed at an angle with respect to the horizontal 5° to 15° greater than said acute angle.

4,648,741

VIBRATORY SCREED INCLUDING A SPREADING DEVICE FOR LEVELING AND DISTRIBUTING PLASTIC CONCRETE IN FRONT OF THE SCREED

J. Dewayne Allen, 208 N. 7th St., Paragould, Ark. 72450

Continuation-in-part of Ser. No. 598,662, Apr. 10, 1984, abandoned, which is a continuation of Ser. No. 457,727, Jan. 13, 1983, Pat. No. 4,466,757. This application Feb. 22, 1985, Ser. No. 704,339
The portion of the term of this patent subsequent to Aug. 21, 2001, has been disclaimed.
Int. Cl.[4] E01C *19/22*, *19/30*
U.S. Cl. 404—119 **10 Claims**



1. A vibratory concrete screed for finishing the surface of an area of unfinished plastic concrete lying between first and second spaced apart, generally parallel forms, the spacing between the first and second forms defining the width of the plastic concrete, said screed comprising:

a. a frame having first and second ends with a length equal to or greater than the width of the plastic concrete;

b. a screed blade coupled to said frame and including a substantially horizontal blade surface and a leading edge;

c. means coupled to said frame for advancing said screed along the length of said forms into the unfinished plastic concrete;

d. means for vibrating said screed blade; and

e. concrete spreading means coupled to said screed for par-

tially levelling the unfinished plastic concrete and for regulating the charge height of the concrete intercepted by the leading edge of said screed blade, including

i. an auger having a longitudinal axis, a leading edge and a trailing edge;

ii. carriage means for maintaining said auger at a predetermined elevation in front of said screed blade with the longitudinal axis of said auger inclined at an angle to said screed blade with the leading edge of said auger extending outward from said screed blade and in front of the trailing edge of said auger, for translating said auger in either a first or a second direction along said screed frame, and for rotating said auguer to laterally redistribute said plastic concrete, to displace said concrete forward and away from said screed blade and to thereby form an intermediate, partially levelled concrete surface; and

iii. metering means coupled to said carriage means to maintain a gap between said metering means and said screed blade, said metering means having a lower surface maintained below the intermediate concrete surface formed by said auger and above the horizontal blade surface of said screed blade for regulating the charge height of plastic concrete fed to the leading edge of said screed blade and for moving excess height plastic concrete forward into the rotating trailing edge of said auger where said excess height concrete is intercepted and displaced forward toward the leading edge of said auger and away from said metering means and is laterally redistributed by said auger as said carriage means translates said metering means and said auger in first and second directions along the length of said screed frame.

4,648,742

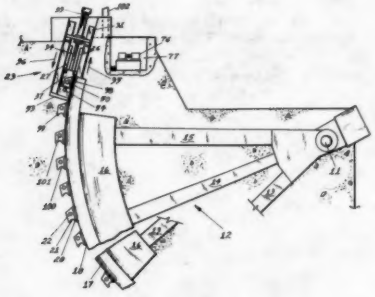
TAINTER GATE SYSTEM

Dennis C. Strecker, 1079 Colonial Club Dr., Harahan, La. 70123

Continuation of Ser. No. 375,071, May 5, 1982, abandoned. This application Aug. 27, 1985, Ser. No. 769,819

Int. Cl.⁴ E02B *7/46*

U.S. Cl. 405—100 **40 Claims**



1. A lifting mechanism for raising and lowering a tainter gate with respect to a pier comprising

a. a tainter gate having a plurality of lifting apertures associated therewith;

b. a plurality of pins positioned adjacent said apertures such that said pins may selectively engage and disengage said apertures; and

c. pin control means for controlling the engagement and disengagement of said pins with said apertures and for controlling the raising and lowering of certain of said pins with respect to other of said pins to raise and lower said tainter gate in a step sequence, said control means being affixed to the pier.

4,648,743

METHOD OF PRODUCING A SUBTERRANEAN STRUCTURE

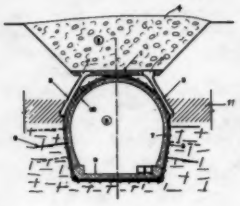
Gerhard Sauer, St. Jakob/Thurn 125, A-5412 Puch/Salzburg, Austria

Filed Oct. 23, 1985, Ser. No. 790,470

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1984, 3443040

Int. Cl.⁴ E21D *9/00, 11/00*

U.S. Cl. 405—138 **6 Claims**



1. A method of producing a subterranean structure with a ceiling in the ground, which comprises the sequential steps of

(a) excavating a ditch in the ground to a desired subterranean level, the ditch having a bottom with respective longitudinal edges at said level,

(b) placing the ceiling directly on the bottom of the excavated ditch, the ceiling having two opposite ends and respective longitudinal edges substantially coinciding with the longitudinal edges of the ditch bottom,

(c) fixing the ceiling in position on the ditch bottom and stabilizing the ground below said level by anchoring the ceiling with retaining elements projecting along the longitudinal edges of the ceiling downwardly from the ceiling into the ground below said level,

(d) filling the ditch, and

(e) driving an arched tunnel into the ground below and along the anchored ceiling between the retaining elements, the retaining elements forming piles protecting the arched tunnel at respective sides thereof and preventing earth from crashing through the arched tunnel, the ceiling resting with its two opposite ends respective on the arched tunnel and on the existing ground, and the ceiling with the retaining elements forming a protective cap over the arched tunnel.

4,648,744

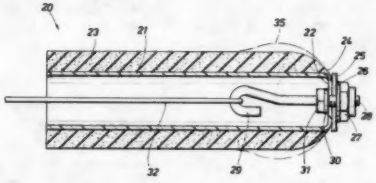
METHOD AND APPARATUS FOR POSITIONING OPTICAL FIBERS IN A BURIED CONDUIT

Kenneth M. Knapp, 1209 Hardy, Houston, Tex. 77020

Filed May 3, 1985, Ser. No. 730,281

Int. Cl.⁴ F16L *1/02*

U.S. Cl. 405—154 **25 Claims**



1. A method of installing an optical fiber leader in a plastic pipe comprising the steps of:

(a) for a length of plastic pipe, placing a leader towing pig in the pipe;

(b) connecting the towed leader to the nose portion of the

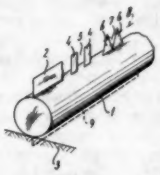
pig to load the pig body, causing an enlargement of the nose portion pig diameter;
(c) forcing a propellent fluid into the plastic pipe to force the pig along the plastic pipe;
(d) defining a controllable blow-by relative to the pig;
(e) towing behind the pig an optical fiber leader of indefinite length wherein pig travel along the plastic pipe increases the length of the towed member therebehind in the plastic pipe; and
(f) reducing the blow-by to increase the thrust force acting on the pig to compel the pig along the plastic pipe as the drag force from the towed member increases with length of pipe traversed.

4,648,745

METHOD AND DEVICE FOR BURYING A CONDUIT IN THE BOTTOM OF A WATERBED

Cornelis H. Hulsbergen, Emmeloord, Netherlands, assignor to Stichting "Stichting Waterbouwkundig Laboratorium", Delft, Netherlands

Filed Apr. 6, 1984, Ser. No. 597,532
Claims priority, application Netherlands, Apr. 7, 1983, 8301230
Int. Cl.⁴ F16L *1/04*
U.S. Cl. 405—159 **25 Claims**



1. A method for burying a conduit such as a pipeline which is laid on the bottom of a water bed over which a substantially horizontal water flow occurs, comprising the step of providing a first protruding part which is arranged in the path of said water flow, said first protruding part being disposed to provide resistance to said water flow and being securely connected to said conduit, and the projection of said first protruding part on a plane transverse to the direction of said water flow having sufficiently large dimensions such that disturbances and/or turbulences which erode said bottom adjacent to and underneath said conduit are increased by said first protruding part.

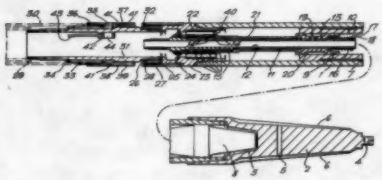
4,648,746

PIPE LAYING AND REPLACEMENT

Raymond E. Abinett, Rochester, England, assignor to Water Research Centre, England

PCT No. PCT/GB84/00386, § 371 Date Aug. 28, 1985, § 102(e) Date Aug. 28, 1985, PCT Pub. No. WO85/02215, PCT Pub. Date May 23, 1985
PCT Filed Nov. 9, 1984, Ser. No. 756,981
Claims priority, application United Kingdom, Nov. 10, 1983, 8330039
Int. Cl.⁴ F16L *1/00*
U.S. Cl. 405—184 **18 Claims**

1. Apparatus for use in the laying and/or replacement of pipes underground which comprises a cylindrical casing, a conical or frusto-conical member secured to one end of the casing and adapted to form an underground passage for the casing when the apparatus is being driven through the ground, a piston reciprocally mounted in the casing and arranged to be driven by a source of compressed air or other fluid to engage said conical or frusto-conical member with a series of impacts to drive said member through the ground, means for connecting the interior of the casing to a source of compressed air or other fluid, valve means to ensure that the piston is reciprocated in the casing by said compressed air or other fluid, a pipe fitting for clamping to the leading end of a pipeline which is to be laid in the underground passage formed by said conical or frusto-conical member and a connection between the pipe fitting and the said other end of the casing, said connection comprising a sleeve connected to the said other end of the



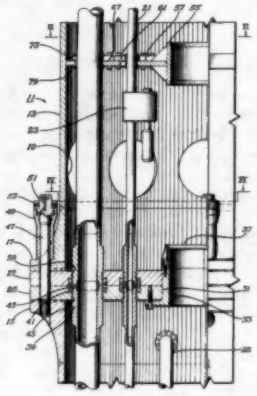
casing and having an internal flange, the pipe fitting being a free sliding fit in the sleeve to permit relative rotation between the pipe fitting and the sleeve, and hence the casing, and said pipe fitting being retained in the sleeve by projection means which are engageable with said internal flange of the sleeve.

4,648,747

INTEGRAL BUOYANT RISER

Bruce J. Watkins, Palos Verdes; Albert M. Regan, Huntington Beach, both of Calif.; Bruce L. Crager, Houston, Tex.; Gary L. Fox, Hermosa Beach, Calif., and Robert C. Houlgrave, Houston, Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Jun. 26, 1985, Ser. No. 748,786
Int. Cl.⁴ E21B *7/12*
U.S. Cl. 405—195 **6 Claims**



1. A riser string extending upwardly from a subsea location, comprising in combination:
a plurality of outer conduits;
a plate secured to each end of each outer conduit, each plate having a plurality of holes;
a plurality of inner conduits extending through the outer conduits for conveying production and control fluids, each inner conduit having an end that extends into one of the holes;
port means in the outer conduits for admitting sea water into the outer conduits;
gas injection means in the outer conduits for injecting gas into the outer conduits to provide a selected buoyancy in the riser string; and
securing means for securing the outer conduits together with the adjacent plates of adjoining outer conduits in contact

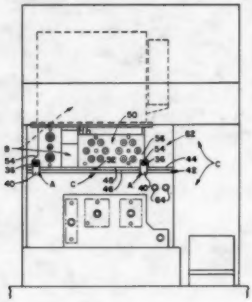
with each other, the plates being intrinsically formed with an outwardly protruding configuration, so that when compressed together by the securing mean, they flatten and exert a preload compressive force across each other, causing the inner conduits to sealingly communicate with each other.

4,648,748

CLAMP ASSEMBLY

Michael R. Fitzgibbons, Houston, Tex., assignor to Ferranti Subsea Systems, Ltd., London, England

Filed Jun. 27, 1984, Ser. No. 625,144
Int. Cl.[4] E02D *29/00*
U.S. Cl. 405—195 **4 Claims**



1. Apparatus for securing a first housing member of a subsea electrohydraulic control module to a second fixed base member of an undersea landing base and having a planar surface supporting said first housing member, said apparatus comprising:

an L-shaped clamping member having a planar leg portion and a tapered shoe portion, with said leg portion rotatably carrying a threaded fastener so as to have portions thereof extending outwardly from opposed faces of said leg portion, said threaded fastener having a tapered front end, being threaded along a portion of an elongated body, and having means adjacent a rear portion adapted to be rotatably driven by a drive tool, said threaded portion extending outwardly from one face of said leg portion and said rear portion extending outwardly from a face of said leg portion to said one face;

a pair of annular collar members secured to said threaded fastener on either side of said clamping member leg portion, said collar members preventing longitudinal movement of said threaded fastener with respect to said clamping member leg portion;

a hold-down ear provided on the first housing member having a threaded aperture penetrating therethrough and adapted for selective receipt of said threaded fastener; and,

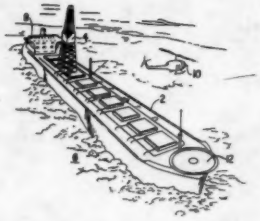
a tapered surface portion provided on the second fixed base member spaced from said planar surface and cooperable with said tapered shoe portion when said threaded fastener is received in said threaded aperture of said hold-down earm, whereby advancement of the threaded fastener in said aperture causes a clamping force to be generated through said clamping member and between said first housing and second fixed base members.

4,648,749

METHOD AND APPARATUS FOR CONSTRUCTING AN ARTIFICIAL ISLAND

Barry W. Ferguson, Delta, Canada, assignor to Bow Valley Industries Ltd.; Bow Valley Resource Services Ltd. and Canarctic Ventures Ltd., all of Calgary, Canada

Continuation-in-part of Ser. No. 423,248, Sep. 24, 1982, abandoned. This application May 2, 1985, Ser. No. 729,750
Claims priority, application Canada, Jun. 11, 1982, 404924
Int. Cl.[4] E02B *17/00*
U.S. Cl. 405—205 **34 Claims**



1. A well drilling and producing unit for forming in a relatively shallow body of water which may be congested with ice and other materials a well drilling and producing facility positioned on the bottom of the body of water, said unit comprising (1) a conventionally designed tanker comprising bow and stern portions longitudinally tapered with respect to the central vertical plane of its hull, normally capable of transporting oil, bulk material, ore material or a combination of the foregoing materials, said tanker being capable of having its hull at least partially submerged to rest on the bottom of the body of water and being of a strength sufficient to provide stability for well drilling and producing operations and resistance against damage due to ice and other materials that may be present in the body of water, said tanker having been modified to provide an enclosed cavity means extending vertically downwardly completely through the tanker, (2) means on the tanker for taking on moveable ballast for sinking at least a portion of the hull of the tanker onto the bottom of the body of water, and (3) well drilling or producing equipment mounted in operational relationship to the said cavity means.

4,648,750

JACKET TOWER STRUCTURE AND METHOD OF INSTALLATION

Edward E. Horton, 85 Vanderlip Dr., Portugese Bend, Calif. 90274

Filed Mar. 25, 1985, Ser. No. 715,931
Int. Cl.[4] E02D *21/00*
U.S. Cl. 405—208 **23 Claims**

1. A method of installing a floatable jacket tower structure at a subsea site, said tower structure having a base means and a top means and including at least three cylindrical legs, hollow water tight bracing of selected volume at lower portions of said tower and water tight bracing of less volume at upper portions of said tower, said legs having a plurality of water tight compartments each provided with check valves to admit water at selected pressures, and means for selectively pressurizing certain of said compartments with air under pressure in relation to the depth to be reached by said compartments during installation; comprising the steps of:

transporting said jacket tower to a subsea site;

floating said tower on at least two legs with other portions out of the water;

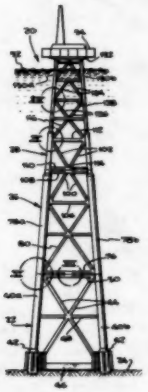
rolling said tower structure 60 degrees about a longitudinal axis at one of said two legs to position at least one leg beneath the water surface and to leave at least two legs at the water surface;

pressurizing at least certain of said leg compartments in

accordance with the hydrostatic pressure at a water depth to be reached by said certain compartments during upending;

flooding the bracing at the base means of the tower structure to commence submerging of the base means;

admitting water into the lowermost leg compartments of the lower portion of the jacket tower by water pressure overcoming preselected air pressure therein to automatically



continue submerging of the base means until the jacket tower has reached a vertical position;

relieving said air pressure in certain of said lower leg compartments to permit admission of additional water into said leg compartments to cause further lowering of said jacket tower to the sea bed;

and filling additional leg compartments and said bracing with water to cause the jacket tower structure to settle and rest in stable vertical position on the sea floor.

4,648,751

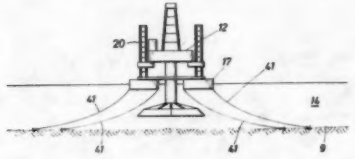
METHOD AND APPARATUS FOR ERECTING OFFSHORE PLATFORMS

Richard K. Coleman, Newbury Park, Calif., assignor to Exxon Production Research Co., Houston, Tex.

Filed Nov. 12, 1985, Ser. No. 797,371

Int. Cl.[4] E02B 17/02

U.S. Cl. 405—209 **8 Claims**



1. A method of erecting an offshore platform including a deck and marine substructure comprising the steps of:

transporting a deck supported on jack-up legs mounted on a pontoon raft having a U-shaped configuration to a marine platform substructure;

positioning said raft over said substructure;

lowering said deck onto said substructure using said jack-up legs;

attaching said deck to said substructure;

transporting said mated substructure and deck;

lowering said substructure to the sea floor using said jack-up legs; and

disconnecting said deck from said jack-up legs.

4,648,752

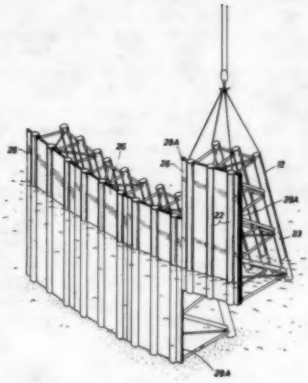
MARINE TEMPLATE RETAINING WALL AND METHOD OF CONSTRUCTION

Arthur L. Guy, and Maynard S. Glascock, both of Houston, Tex., assignors to Exxon Production Research Co., Houston, Tex.

Filed Aug. 29, 1985, Ser. No. 770,441

Int. Cl.[4] E02B 17/02

U.S. Cl. 405—217 **3 Claims**



1. A marine retaining wall comprising:

a plurality of interconnected templates, each template comprising a series of vertically extending spaced apart legs and a series of battered spaced apart legs providing a cross-section for each template that increases from top to bottom;

diagonally and horizontally extending brace support members interconnecting said vertical and battered legs of each template;

a tract guide on one lateral end of each template;

a rider guide on the other lateral end of each template;

said rider guide engaging said tract guide on adjacent templates;

sheet means connected to said vertical legs forming a continuing wall across each template;

piles extending through said vertical and battered legs into the ground underlying the water; and

said wall comprising an enclosure and fill material within said enclosure to form an artificial island.

4,648,753

ROCK-BOLT STABILIZER DEVICE FOR MINING AND TUNNELING APPLICATIONS

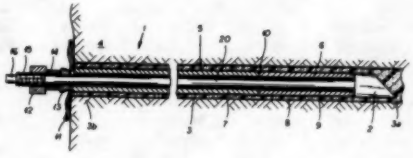
Peter Stephan, Essen, Fed. Rep. of Germany, assignor to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Apr. 25, 1985, Ser. No. 727,026

Claims priority, application Fed. Rep. of Germany, May 10, 1984, 3417252

Int. Cl.[4] E21D 21/02

U.S. Cl. 405—260 **10 Claims**



1. A stabilizer device which can be affixed in a respective

borehole in mining and tunneling, said device being adapted to perform the function of a rigid profile anchor under certain stress conditions and adapted to perform the function of an expansion achor under other stress conditions, such device comprising:

an anchor member comprising a metal rod having a first end formed with a mixing element and which can be secured near the base of said borehole by a cementitious composition and a second end remote from said first end and extending out of said borehole,

said anchor member being made of a material having expansion properties to perform said function of an expansion anchor;

a first rigid metal pipe section closely surrounding a portion of said rod within said borehole adjacent said first end, said first rigid metal pipe section having a surface which can be joined to the wall of said borehole by a cementitious composition and being bonded to said rod over the length of said first rigid metal pipe section; and

a second rigid metal pipe section closely surrounding the rest of the length of the rod and aligned with the first section within the borehole and extending from said first rigid metal pipe section to a location close to the mouth of the borehole, said second rigid metal pipe section having a surface which can be joined to the borehole wall by a cementitious composition and being connected to said first rigid metal pipe section by a joint which yields under certain of said stress conditions.

4,648,754

ARRANGEMENT FOR TRANSPORTING FIBER FLOCKS

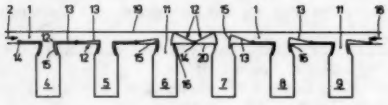
Paul Stäheli, Wilen b. Wil; Urs Stähli, Turbenthal, and Fritz Knabenhaus, Winterthur, all of Switzerland, assignors to Maschinenfabrik Rieter A.G., Winterthur, Switzerland

Filed Aug. 28, 1985, Ser. No. 770,650

Claims priority, application Switzerland, Aug. 28, 1984, 04119/84

Int. Cl.[4] B65G *53/04, 53/58*

U.S. Cl. 406—156 **6 Claims**



1. An arrangement for pneumatically transporting fiber flocks to a plurality of carding devices, comprising an elongated duct having a top wall, a bottom wall and two opposite side walls interconnecting said top and bottom walls and bounding a cross-sectionally rectangular passage which has two longitudinally spaced ends and is of a constant cross-sectional area throughout; a plurality of chutes each associated with one of the carding devices and communicating with said passage and extending downwardly from said duct; means for introducing a transporting medium carrying the fiber flocks into at least one of said ends of said passage for flow longitudinally of said passage and for supplying the fiber flocks to the respective chutes; a plurality of control elements each including a control member and a block member rigid with said control member and extending substantially at a right angle thereto; means for mounting said control elements in said duct for pivoting about respective pivot axes longitudinally spaced from the respective chutes and arranged at said bottom wall in such a manner that two of said control elements are arranged between each two of said chutes in a mirror-image fashion with their control members extending from said mounting means toward said chutes and that said block members thereof extend toward the respective chute and into the latter in all pivoted positions of the respective control element; and means for pivoting said control elements between said pivoted positions thereof and for arresting said control elements in selected ones of said pivoted positions.

4,648,755

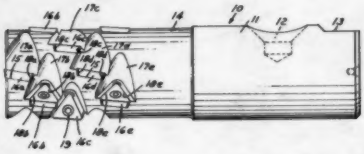
MULTIPLE INSERT END MILL

Daniel R. Stashko, Holly, Mich., assignor to GTE Valeron Corporation, Danvers, Mass.

Filed Jul. 15, 1985, Ser. No. 754,993

Int. Cl.[4] B26D *1/00*

U.S. Cl. 407—36 **5 Claims**



1. An indexable insert end mill comprising an annular cylindrical body, a plurality of individual insert pockets formed in the cylindrical periphery of said body, each of said pockets having a seat for holding an insert with its cutting face in a substantially axial plane modified to the extent of any axial and radial rake angles which are the same for every insert, an indexable triangular straight cutting edge insert retained in each pocket by a central screw with a single cutting edge extending substantially parallel to the axis of the endmill projecting beyond said periphery, said cutting edge having a lead corner spaced ahead of a radial in the cutting direction, a positive axial rake, and an axial correction angle of less than one degree at said lead corner to position the cutting edge to enable the end mill to cut approximately a square shoulder, each pocket having a chip clearance wall associated therwith, said wall providing chip clearance space projecting from the entire cutting face to the periphery of said body, each pocket with its chip clearance wall being substantially isolated from every other pocket by surrounding cylindrical periphery of said body, said insert pockets being provided in three equally circumferentially spaced rows, each row extending with a plurality of axially spaced inserts in a helical path, each row having insert pockets in like axial positions, and said insert pockets in each row being uniformly spaced with active cutting edges of adjacent inserts in overlapping relationship in an axial direction, and angularly spaced in the order of forty degrees in a circumferential direction on the helical path of said row.

4,648,756

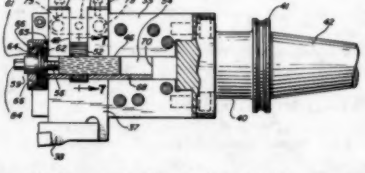
TWO SPEED AUTOMATIC SHIFT DRILL

Robert H. Alexander, Columbia; John R. Lawson, Irmo, and Ronald C. Falter, Columbia, all of S.C., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Dec. 13, 1985, Ser. No. 808,583

Int. Cl.[4] B23B *45/04*

U.S. Cl. 408—9 **9 Claims**



1. A drill for rotationally driving a bit into a workpiece at

one of the two speeds according to the depth of the bit in the workpiece, comprising:

a cam block element having a flag section and a gap section;

a vent element having an orifice adapted to be closed adjacent to the flag section and open adjacent to the gap section;

one of said elements being mounted to move in translation with the bit and the other of said elements being mounted to be stationary with respect to the workpiece, with the orifice and the cam block element in operative relationship to one another so that either the flag section or the gap section is adjacent to the orifice according to the depth of the bit in the workpiece;

shifting means responsive to pneumatic pressurization for changing the rotational speed of the bit from one speed to the other speed;

supply means adapted for connection to a source of compressed air; and

means for providing communication between the supply means, the shifting means and the orifice;

wherein the orifice vents the shifting means when it is adjacent to the gap section to drive the bit at one speed and seals the shifting means when it is adjacent to the flag section to change the speed of the bit to the other speed according to the depth of the bit in the workpiece; and

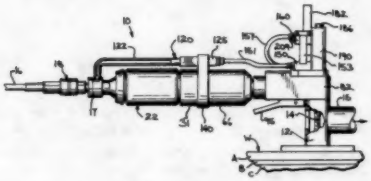
vent means responsive to retraction of the bit from the workpiece to depressurize the shifting means thereby shifting to the lower of the two speeds upon retraction of the bit.

4,648,757

PRECISION ADJUSTMENT SYSTEM FOR BORING TOOLS

Harvey R. Plummer, Fond du Lac, Wis., assignor to AMCA International Corporation, Fond du Lac, Wis.

Filed Nov. 18, 1982, Ser. No. 442,625
Int. Cl.[4] B23B *47/18*
U.S. Cl. 408—12 **4 Claims**



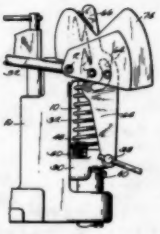
1. A machine tool having a power driven spindle, a work support adapted to hold a workpiece, and a system for radial adjustament of a boring tool to accurately size a bore in the workpiece, said system comprising, in combination: a boring tool adapted for mounting in the spindle of said machine tool; a toolholder and cutter disposed transversely and generally radially of said boring tool; precision adjusting means in said boring tool for setting the radial position of said toolholder and cutter, said precision adjusting means including an adjusting wedge housed within said boring tool and disposed for sliding movement axially thereof, a precision lead screw disposed in threaded engagement with said adjusting wedge and adapted to move said adjusting wedge axially of said boring tool, means for holding said lead screw captive against relative axial movement with respect to said boring tool while permitting relative rotary movement with respect to said boring tool, means defining toothed serrations on said adjusting wedge, and means defining toothed serrations on said toolholder adapted to engage said serrations on said wedge, said means defining toothed serrations on said toolholder being fixed rigidly on said toolholder, and the toothed serrations on said adjusting wedge and on said toolholder being axially skewed to provide radial adjustment of said toolholder in response to said axial sliding movement of said adjusting wedge; a precision adjusting actuator adapted for engagement with driver means on said lead screw to change the radial position of said toolholder and cutter; an adjusting control connected to said actuator for causing said actuator to operate said precision adjusting means to alter the radial position of said toolholder and cutter by an amount proportional to the difference in size between a preliminary undersized bore in the workpiece and the final bore required therein; means defining a longitudinal slot in said toolholder commencing at the end remote from said cutter and terminating short of the end of where said cutter is situated; and a T-shaped insert rigidly secured to said toolholder, said insert comprising a longitudinal stem housed within said slot and a cross member abutting the end of said toolholder remote from the cutter; said means defining toothed serrations on said toolholder being defined in said longitudinal stem.

4,648,758

TWO POSITION LINKAGE

Andrew L. Itzov, Menomonee Falls, Wis., assignor to Milwaukee Electric Tool Corporation, Brookfield, Wis.

Filed Jul. 1, 1985, Ser. No. 750,185
Int. Cl.[4] B23B *45/06*
U.S. Cl. 408—136 **8 Claims**



1. A drill stand comprising

a vertical column,

a clamp moveably mounted on said column

a carriage adapted to support a drill and moveably mounted on said column for movement with and with respect to said clamp,

a link pivoted on said clamp and having two pivot locations, and

a manually actuated lever arm pivotally connected to said carriage and having pivot means selectively engagable with either of said pivot locations to change the force multiplication and travel distance as said arm is pivoted about the selected pivot location.

4,648,759

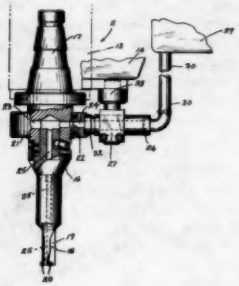
AUTOMATIC COOLANT INDUCER ARRANGEMENT

Sebastian Ebenhoch, Waukesha, Wis., assignor to Waukesha Cutting Tools, Inc., Waukesha, Wis.

Filed Aug. 28, 1985, Ser. No. 770,387
Int. Cl.[4] B23B *27/10, 51/06*
U.S. Cl. 408—59 **3 Claims**

1. In a machine tool having a head and a spindle drivingly supported by the head, a cutting tool comprising a generally cylindrical body and having a shank at one end thereof engageable within the machine tool spindle, a coolant inducer ring confined axially on the shank of the tool in spaced relation from the spindle engaging portion and having an inlet passage, said coolant inducer ring further having an upwardly opening U-shaped recess on the periphery thereof, said recess containing the inlet passage and being symmetrical relative to a vertical plane containing the axis of the passage and with the opposed recess walls tapering upwardly and outwardly to provide a funnel-shaped recess, said cutting tool body having flutes opening toward the leading end of the cutting tool and

cutting edges associated with said flutes, said cutting tool body further having internal coolant passages with discharge openings adjacent to the cutting edges, said coolant passages communicating with said coolant inducer ring, a coolant inducer pipe having one end thereof communicating with a source of coolant, said inducer pipe being supported to place the opposite free open end thereof in fixed relation adjacent to and



beneath the machine tool spindle, said free end of the coolant inducer pipe being engageable within the coolant inducer ring recess simultaneously with engagement of the shank of the cutting tool within the machine tool spindle, said recess serving to align the coolant inducer ring inlet passage with the coolant inducer pipe and thereby provide for coolant flow through and from the cutting tool to cool the cutting tool and workpiece in service.

4,648,760

DRILL AND CUTTING INSERT THEREFOR

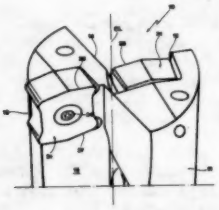
Kurt O. Karlsson, Sandviken, and Leif E. Karlsson, Karlholmsbruk, both of Sweden, assignors to Santrade Limited, Lucerne, Switzerland

Filed Oct. 31, 1985, Ser. No. 793,259

Claims priority, application Sweden, Nov. 12, 1984, 8405643

Int. Cl.[4] B23B *51/00*

U.S. Cl. 408—223 **8 Claims**



6. A drill adapted to receive a plurality of inserts including first and second identically shaped inserts each including opposed cutting edges such that one cutting edge is positioned to cut and the other cutting edge is positioned to be inactive; said drill being rotatable about a longitudinal axis and including a front cutting face, an outer longitudinal surface, first and second chip flutes formed in said outer surface, and first and second insert sites disposed at forward ends of said first and second flutes, respectively, for receiving said first and second inserts; said first insert site disposed radially inwardly with respect to said second insert site; a radially outermost portion of said first insert site disposed radially inwardly of said outer surface of said drill; said second insert site radially intersecting said outer surface; each of said insert sites comprising a first support surface arranged to receive tangential cutting forces acting upon the drill, a second support surface arranged to receive axial cutting forces, and a third support surface arranged to receive radial cutting forces; each of said second support surfaces including longitudinally inwardly converging sections adapted to support a corresponding inactive cutting edge of the respective inserts; said third support surface of said first insert site including a main section extending parallel to said longitudinal axis, and front and rear recessed sections disposed at longitudinal ends of said main section; each of said recessed sections being recessed radially inwardly with respect to said main section and extending radially beyond said longitudinal axis for receiving corresponding cutting edge portions of said first insert, said front recessed section disposed at said front cutting face; said third support surface of said second insert site including a main section diverging longitudinally outwardly relative to said longitudinal axis to form an acute angle therewith, and front and rear recessed sections disposed at longitudinal ends of said last-named main section; each of said last-named recessed sections of said second insert site being recessed radially inwardly with respect to said last-named main section for receiving corresponding cutting edge portions of said second insert, said last-named front recessed portion disposed at said front cutting face.

4,648,761

MACHINING METHOD

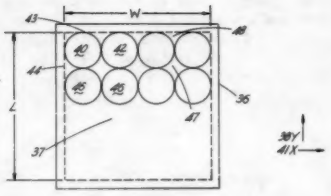
Robert N. Mitchell, and James L. Hunt, both of Raleigh, N.C., assignors to Kennematel, Inc., Latrobe, Pa.

Continuation of Ser. No. 595,375, Mar. 30, 1984, abandoned.

This application Nov. 14, 1985, Ser. No. 797,768

Int. Cl.[4] B23P *13/02*; B23C *3/00*

U.S. Cl. 29—558 **4 Claims**



1. The method of removing material from a workpiece which comprises the steps of: forming cylindrical holes having a predetermined depth in a workpiece; positioning said holes so that portions of their circumferences are tangent with at least portions of the circumferences of two other holes in the surface of the workpiece; forming posts or cusps bounded by portions of the tangent diameters of said holes; removing said posts and cusps from the workpiece; reciprocally moving a center cutting end mill along its z axis to form said holes and to remove said posts.

4,648,762

APPARATUS FOR PREPARING THE EDGES OF METAL SHEETS TO BE WELDED

Sture Hall, Runemo 4231, S-82200 Alfta, and Bertil Persson, Vretvägen 6C, S-80239 Gävle, both of Sweden

Filed Jun. 27, 1984, Ser. No. 625,352

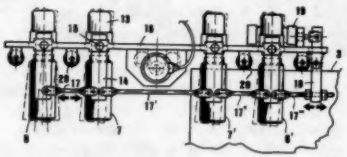
Claims priority, application Sweden, Jul. 1, 1983, 8303779

Int. Cl.[4] B23C *3/12*

U.S. Cl. 409—138 **9 Claims**

1. Apparatus for preparing the edges of a metal sheet to be welded, said sheet having first and second main surfaces, comprising an assembly of metal working means, in particular milling cutters, being included in a unit associated with means for producing a relative movement between said sheet and said unit, during which movement said metal working means are working an edge of said sheet, characterized in that said means for producing said relative movement comprise, seen in the direction of the movement, a first set of rotatable rollers before

and a second set of rotatable rollers after said metal working means, each set comprising at least three rollers which can be pressed against said main surfaces of said sheet, at least one roller of each set being disposed at the first main surface of the sheet and at least two rollers of the set being disposed at the second main surface of the sheet as well as being spaced from each other in the direction of movement in order, together with said at least one roller that is disposed at the first main surface of the sheet, to safely hold on to the sheet also when



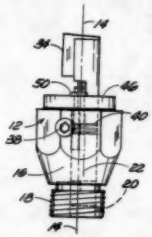
said metal working means have passed the end of the sheet edge being worked, and that at least one roller of each set of rollers is a driven roller that is positioned at an angle or angularly positionable in relation to the direction of movement and in a plane parallel to the sheet in order, during working of the sheet edge, to impart to the sheet not only a longitudinal component force bringing about said relative movement between the sheet and said unit, but also a transverse component force that urges the edge of the sheet and said metal working means against each other.

4,648,763

COUNTERBALANCED ADJUSTABLE ROUTER BIT

Leland Safranek, Atascadero, Calif., assignor to Safranek Enterprises, Inc., Atascadero, Calif.

Filed Aug. 18, 1986, Ser. No. 897,794
Int. Cl.[4] B23C *9/00*; B23B *41/00*; B26D *1/12*
U.S. Cl. 409—234 **4 Claims**



1. An adjustable router bit for cutting dadoes of various widths and characterized by remaining statically balanced throughout its range of adjustment, comprising in combination:

a main body having an axis of rotation and including a bore parallel to but offset from said axis of rotation;

an arbor fitting within the bore of the main body with a loose sliding fit for rotation about the axis of the bore, said arbor including a projecting portion extending from the bore of said main body to an end, said projecting portion including an eccentric portion;

a cutter affixed to the end of the projecting portion of said arbor and having a cutting edge that is displaced from the axis of the bore;

means within said main body for rotating said arbor to a chosen angular position within the bore and for holding said arbor at that position, whereby as said arbor is rotated, the displacement of the cutting edge of said cutter from the axis of said main body is altered to alter the width of the dado; and,

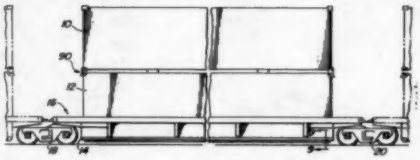
a counterweight having a center of gravity and pivotally attached to said main body with the center of gravity displaced from the axis of rotation of said main body so as to be urged by centrifugal force to an operating position against the eccentric portion of said arbor when said main body is rotated about its axis of rotation, the eccentric portion of said arbor shaped to alter the operating position of said counterweight as the displacement of the cutting edge is adjusted to approximately counteract the unbalance caused by alterations in the displacement of the cutting edge from the axis of rotation of said main body.

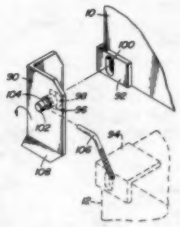
4,648,764

PORTABLE STACKING CONTAINERS LOCKING DEVICE

Michael J. Pavlick, Norristown, Pa., assignor to The Budd Company, Troy, Mich.

Filed Jun. 7, 1982, Ser. No. 385,697
Int. Cl.[4] B60P *7/13*; B61D *3/20*
U.S. Cl. 410—77 **8 Claims**





1. A combination for stacking containers of the same size in a flat carrier of a predetermined size with the containers including corner fittings for receiving locking devices therein;

(a) a plurality of angle members dimensioned to overlap the corner fittings of an upper and lower container when two containers are stacked;

(b) each of said angle members include angular portions extending from one end thereof to facilitate the placing of one container over another when said angle members are in place;

(c) said carrier comprising an elongated well therein formed by a floor surrounded by front, rear and a pair of side walls to receive said lower container therein and to restrict the movement of said lower container when the size of said bottom container is of substantially the same dimensions as said lower container;

(d) a locking device connected to each of said angle members to lockingly engage one of said upper or lower containers whereby when said plurality of angle members are locked in place, they will maintain the relative positions of said upper and lower container with respect to each other,

(e) said locking device including a lock member disposed to be inserted into the opening of a corner fitting of one of said containers and a turn bar adapted to be manually turned through a right angle to lock said lock member to said one container;

(f) means in said carrier to provide a movable bulkhead

normally stored in the floor of said flat carrier and adapted to be moved into a position to limit the movement of said containers when said container is dimensioned shorter than said floor; and

(g) a connecting bar slidably mounted within said movable bulkhead at both ends thereof and adapted to be moved into side sill members forming parts of said side walls to provide longitudinal restraining means laterally across the floor of said flat carrier.

4,648,765

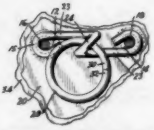
UNIVERSAL TIE-DOWN BRACKET

John W. Kovaleski, Lake Parkway, Webster, Mass. 01570, and Thomas M. Lee, Irene St., Douglas, Mass.

Filed Sep. 19, 1985, Ser. No. 777,721

Int. Cl.[4] B61D *45/00*

U.S. Cl. 410—110 **11 Claims**



1. A two-piece universal tie-down bracket comprising, in combination:

(a) an all one piece integral elongate base member having intermediate its ends an open loop, said open loop comprising a single coil of a helix, said base member having openings at said ends to receive hold-down screws by means of which it can be applied to a supporting surface, and

(b) a tethering ring passing through the open loop of the base member, said ring being adapted to hang loosely in readiness for use from said open loop for any one of an infinitely large number of positions in which the base member can be fastened,

(c) said tethering ring constituting a continuous annulus and being admissible through the opening of said open loop during assembly of the tethering ring to the base member, and said ring being held captive by the supporting surface to which the base member is affixed.

4,648,766

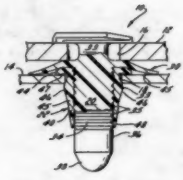
PLASTIC FASTENER FOR DETACHABLY MOUNTING A PANEL ON A SUPPORT MEMBER

Burnell Wollar, Barrington, Ill., assignor to Phillips Plastics Corporation, Phillips, Wis.

Filed Dec. 9, 1985, Ser. No. 806,453

Int. Cl.[4] F16B *13/04*

U.S. Cl. 411—41 **18 Claims**



1. A fastener for releasably mounting one member on another member in fixed spaced apart relationship and for sealing an installation hole in said other member, said fastener comprising:

a hollow grommet for releasable installation in said installation hole, said hollow grommet having a bore therein defined by a resilient deformable bore wall;

a pin attachable to said one member and having a shank insertable into said bore in said hollow grommet;

means for initially connecting said pin and said hollow grommet in predetermined positions relative to each other but enabling subsequent insertion of said shank of said pin into said hollow grommet after said pin is attached to said one member and said grommet is inserted in said installation hole;

means on said shank of said pin engageable with said bore wall for releasably maintaining said shank of said pin inserted in said bore of said hollow grommet to thereby maintain said one member mounted on said other member in fixed spaced apart relationship and for sealing said bore;

and sealing means for said installation hole comprising a resilient flexible first sealing member on said hollow grommet engageable with said other member to seal said installation hole and a resilient flexible second sealing member on said pin for encapsulating said first sealing member and engageable with said other member to further seal said installation hole.

4,648,767

FASTENING ELEMENT

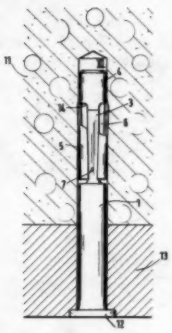
Artur Fischer, Weinhalde 14 - 18, D 7244 Waldachtal 3/Tumlingen, Fed. Rep. of Germany

Filed Jan. 8, 1986, Ser. No. 817,045

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1985, 3523418; Jul. 26, 1985, 3526784

Int. Cl.[4] F16B *13/06*

U.S. Cl. 411—60 **18 Claims**



1. A fastening element insertable into a hole of a structure for fastening an object to the structure, comprising:

a shaft having a forward end a rear end, said shaft having a maximum thickness and a portion by said forward end with a smaller cross-sectional thickness than said maximum thickness;

means for holding an object at said rear end of said shaft;

an expandable sleeve fitted over at least said portion of said shaft, said sleeve having an internal and an external diameter; and

means for expanding said sleeve at said forward end of said shaft, said sleeve being formed as a resilient sleeve which is elastically deformable radially, said external diameter of said sleeve being larger than said maximum thickness of said shaft and said internal diameter of said sleeve being larger than said cross-sectional thickness of said portion of said shaft so as to form a space surrounding said portion of said shaft free of any additional member, said sleeve being compressible into said space, said sleeve being compressed and clinging to the hole when the fastening element is inserted into the hole, said sleeve having resiliency such that even if cracks form in the hole after the fastening element is inserted into the hole, said sleeve continues to cling to the drilled hole.

4,648,768

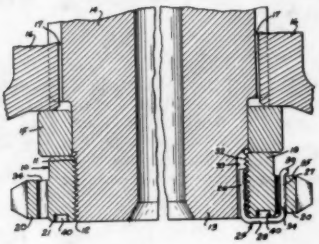
LOCKNUT ASSEMBLY FOR HIGH-SPEED ROTARY COMPONENTS

James C. Hambric, 2894 Florida Ave., Wellsville, N.Y. 14895

Filed May 15, 1984, Ser. No. 610,464

Int. Cl.[4] F16B *39/06*; B63H *1/28*

U.S. Cl. 411—217 **12 Claims**



1. In a locknut assembly for retaining a nut in securely threaded engagement with a rotatably driven element in which a first opening is provided in the rotatably driven element so as to extend generally parallel to the axis of rotation thereof and a second opening is formed through the nut so as to extend generally parallel to and remotely spaced from the first opening in the rotatable element the improvement comprising a generally U-shaped metallic locking spring means having first and second leg portions of substantially equal length and having generally uniform circular cross sections, said leg portions having first and second ends, said first ends of said leg portions being connected by an intermediate portion so that said first and second leg portions normally resist movement toward one another, a tab means extending from the second end of said second leg portion and extending generally perpendicular thereto, said first leg portion of said spring means being selectively receivable within the first opening in said rotatably driven element and said second leg portion of said spring means having a length to permit said second leg portion to extend completely through the nut, said tab means extending generally perpendicularly outwardly with respect to the second opening and the axis of rotation of the rotatably driven element and being of a size to pass through said second opening without being deflected, whereby when the rotatably driven element and the nut are rotated about the axis of rotation said tab means will be extended generally perpendicularly with respect to the second opening so as to prevent withdrawal of said spring means from the first and second openings in the rotatably driven element and nut respectively.

4,648,769

ROUND BALE HANDLER

William Stirling, P.O. Box 202, Lower Nicola, British Columbia, Canada (V0K 1Y0)

Filed May 1, 1984, Ser. No. 605,869

Claims priority, application Canada, Dec. 14, 1983, 443223

Int. Cl.[4] A01D *87/12*

U.S. Cl. 414—24.6 **25 Claims**

1. A round bale handler for use with a prime mover, comprising:

(a) a frame having a rear member;

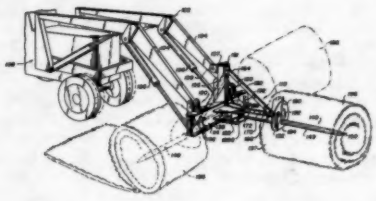
(b) a spike having:

(i) a pointed front portion so as to readily penetrate the bale;

(ii) a rear portion pivotally connected to said frame so that said spike is swingable between a forward position parallel with the normal direction of travel of the prime mover when said frame is connected thereto, and two opposed sideways positions each substantially 90° from the forward position:

said spike being of a sufficient length and positioned on said frame such that the front portion thereof can penetrate through an axis of the bale and extend substantially along the entire length thereof to retain the bale on said spike, when said spike is in the forward and sideways positions;

(c) stop means mounted on said frame for releasably retaining said spike in the forward position and preventing movement thereof rearward of both sideways positions;



(d) A bale keeper moveable along the rear portion of said spike, and extending radially therefrom so as to restrain rearward movement of a bale on the front portion of said spike and which abuts said bale keeper;

(e) a keeper retainer positioned and constructed so as to releasably retain said bale keeper in an extended and a retracted position along the rear portion of said spike, in either of which a bale can be retained on said spike abutting said bale keeper.

4,648,770

STACKING PROFILE ELEMENTS IN NESTED GROUPS

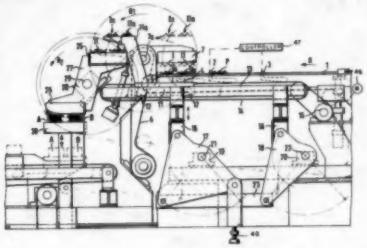
Gerhard Berz; Hans J. Braun, both of Düsseldorf, and Claus G. Schlanzke, Ratingen-Eckamp, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 444,629, Nov. 26, 1982, abandoned. This application Jun. 7, 1985, Ser. No. 742,368

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151482

Int. Cl.[4] B65G *57/18*

U.S. Cl. 414—30 **3 Claims**



1. An apparatus for making small bundles of elongated profile elements arriving generally regularly at an intake station, said apparatus comprising:

conveyor means for displacing the elements in a transport direction generally perpendicular to their elongation direction from the intake station to a pickup station;

means including two stops at the pickup station for arresting the elements in a pair of groups with the elements closely spaced in their respective groups and the groups widely spaced in the transport direction, and other stops spaced along said conveyor means for separating said elements

into said pairs of groups with the groups of successive pairs differing as to the number of elements therein; and

transfer means between the pickup station and a downstream takeoff station for picking up the pairs of spaced groups in the pickup station without substantially changing their spacings and depositing the pairs of spaced groups in the pickup station whereby further pairs of groups formed by the conveyor means and stops are deposited in the takeoff station on top of the previously deposited groups to form a pair of stacks each of the pairs constituting a bundle, the transfer means including:

a pair of transfer magnets jointly orbital about an axis transverse to the direction of displacement of said conveyor means between a position with one transfer magnet facing down in the takeoff station and the other magnet facing up in an upstream transfer station and another position with the other transfer magnet facing down in the takeoff station and the one magnet facing up in the transfer station;

a turning magnet pivotal upstream of the transfer magnets between a position facing down in the pickup station and in which said turning magnet extends over both groups arrested by said two stops, and a position facing up in the transfer station; and

a pickup cart displaceable between a lower position in the pickup station in which said pickup cart can lift both groups arrested by said two stops at said pickup station and an upper position in the transfer station, the transfer magnets being displaceable upward through the turning magnet and pickup cart when said turning magnet and said pickup cart are respectively in the transfer station to take up a pair of groups from the cart in their original orientations on the conveyor means alternating with takeup of a pair of groups from said turning magnet in inverted relationship to their original orientation on the conveyor means whereby said groups of elements are deposited in pairs in said bundles with alternating inversion of groups so that the successively deposited groups interfit in each bundle.

4,648,771

ROBOT HAND FOR STACKING BOXES

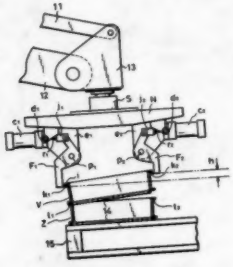
Ikuo Yoshioka, No. 5417, Nogurumi Onoda-shi, Yamaguchi-ken, Japan

Continuation of Ser. No. 747,289, Jun. 21, 1985, abandoned. This application May 7, 1986, Ser. No. 859,238

Claims priority, application Japan, Jul. 13, 1984, 59-105115

Int. Cl.⁴ B65G *57/08*

U.S. Cl. 414—71 **3 Claims**



1. A robot hand for stacking boxes with flanged upper ends and projected lower end portions, said hand comprising a bed board, support pieces secured to and suspended from said bed board to support a first fork, support pieces secured to and suspended from said bed board to support a second fork, a support shaft laterally mounted on said support pieces for said first fork, a support shaft laterally mounted on said support pieces for said second fork, two cylinders, each cylinder having one end pivotally mounted on one of said support pieces, a piston rod attached to each of said cylinders for reciprocal movement, each of said piston rods being independently operable, a connecting piece connected to an extreme end of each of said piston rods, each fork formed integrally at one of its ends with one of said connecting pieces, having an intermediate portion pivotably mounted on one of said support shafts, and a bent portion at the other end, said bent portions of said first and second forks being in the same vertical plane and facing each other on different levels.

4,648,772

THREE-KNIFE CUTTING MACHINE WORKFEED

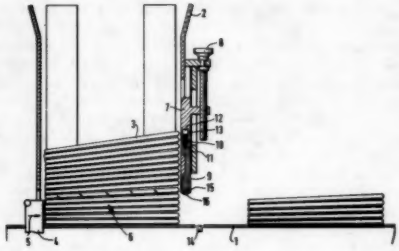
Jürgen Hartlage, Langenhagen, Fed. Rep. of Germany, assignor to H. Wohlenberg KG GmbH & Co., Hanover, Fed. Rep. of Germany

Filed Dec. 13, 1985, Ser. No. 808,878

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1984, 3447798

Int. Cl.⁴ B65G *59/06*

U.S. Cl. 414—115 **11 Claims**



1. A three-knife cutting machine for trimming the front side and the head and foot side of brochures, books, and the like, in which the back side is thicker than the front side, the products to be trimmed are disposed in stacks in a magazine that is continuously chargeable from above, with the back side of the products being disposed adjacent an exit opening in said magazine, adjustable means for pushing a desired stack height from the magazine to a cutting station, an adjustable shutter means disposed in a preselected position adjacent the backside of the products to be trimmed which serves to retain the products remaining over the stack to be led off, control means for adjusting the position of the shutter means to maintain the shutter means in contact with the stack being led off and for returning the shutter to its preselected position after the led off stack has passed the shutter.

4,648,773

CIRCUIT BOARD ASSEMBLY

Zdzislaw Bieganski, Harpenden, England, assignor to Abeco Limited, Milton Keynes, England

Filed Jul. 9, 1985, Ser. No. 753,221

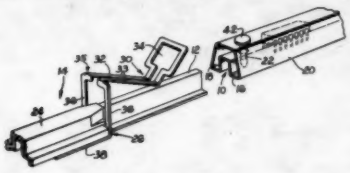
Claims priority, application United Kingdom, Jul. 14, 1984, 8417978

Int. Cl.⁴ B65B *21/02*

U.S. Cl. 414—411 **4 Claims**

1. A circuit board assembly station comprising a carrier tube for holding a plurality of I.C.'s arranged in single file, a pillar having a support member arranged to receive I.C.'s by gravity feed from the carrier tube, a spring for releasably retaining the end of the tube in alignment with the pillar, and a pin having a head, and having a shank extending transversely into the end of the tube to retain I.C.'s in the tube, characterized in that said spring comprises a pair of parallel portions forming therebetween a slot whose width is similar to that of the shank of the pin, the length of the slot lying in a plane containing the axes

of the tube and pillar, the slot having an open end which faces the pin and is less remote than its other end from said axes, whereby the pin is initially pushed outward by engagement



with the pillar and then is engaged in the open end of the slot by axial displacement of the tube relative to the pillar to cam the pin outward into a non-retaining position with respect to I.C.'s in the tube.

4,648,774

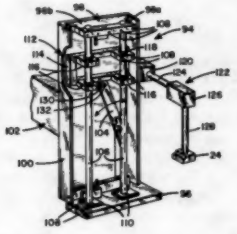
LOAD/UNLOAD APPARATUS FOR DISC-LIKE WORKPIECES

John A. Dorumsgaard, Arden Hills, and Roger H. Amerson, Bloomington, both of Minn., assignors to Methods, Inc., New Brighton, Minn.

Division of Ser. No. 751,098, Jul. 2, 1985, Pat. No. 4,569,625, which is a continuation-in-part of Ser. No. 470,046, Feb. 28, 1983, abandoned. This application Sep. 20, 1985, Ser. No. 778,078

Int. Cl.[4] B65G *65/34*

U.S. Cl. 414—416 **3 Claims**



1. Apparatus for loading and unloading discs from a receptacle containing a plurality of discs organized in a predetermined disposition to one another comprising:

(a) means insertable within said receptacle for supporting at least one of said discs along the inner peripheral edge of a central hole through said disc;

(b) means for vertically reciprocally conveying said disc support means relative to said receptacle comprising:

(1) a first member fixedly coupled and slidably mounted to said disc support means along a predetermined vertical path of travel,

(2) a second member having a roller coupled thereto and in movable supporting relation to said first member,

(3) means for reciprocally rotating said second member and said roller between a first angular position and a second angular position thereby raising and lowering said disc support means along a vertical axis relative to said receptacle,

(c) means for horizontally reciprocally conveying said vertical conveyor means comprising:

(1) a driven sprocket,

(2) an idler sprocket,

(3) an endless notched belt coupled to and trained around said driven and idler sprockets,

(d) a third support member supporting said vertical conveyor means and coupled to said endless notched belt, whereby said vertical conveying means is caused to reciprocally move along a horizontal axis as said endless belt revolves about said driven and said idler sprockets; and

(e) means coupled to said disc support means for selectively rotating each of said discs supported by said support means about an axis passing through the body of the disc as it is transported to and from said receptacle.

4,648,775

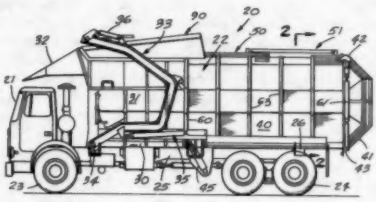
REFUSE PICKUP AND COMPACTOR BODY

Michael L. Verner, Norwalk, Calif., assignor to Maxon Industries, Inc., Huntington Park, Calif.

Filed Jul. 12, 1985, Ser. No. 754,521

Int. Cl.[4] B65G *65/04, 7/00*

U.S. Cl. 414—513 **3 Claims**



1. A refuse compactor body for vehicle mounting comprising:

a parallel pair of longitudinally extending floor beams;

a tank mounted on rear portions of said beams, said tank having an opening comprising an open forward end of said tank, said opening having a peripheral girth reinforcement of said tank as the frame of said opening;

a hopper mounted on forward end portions of said beams, said hopper having opposite said walls defining an open rear end of said hopper rigidly secured to and communicating with said opening of said tank;

a packer comprising a rigid body mounted within said hopper for reciprocation longitudinally of said hopper between a fully retracted position in which said packer is positioned at a forward end of said hopper and a fully extended position at which said packer partially penetrates through said opening and into a forward end portion of said tank;

said packer having a rear face of an area to obturate all but about an upper one-third of said opening in said forward end of said tank;

a horizontally extending guide means mounted within said hopper and said forward end portion of said tank, said guide means being of a length for guidably supporting said packer for said longitudinal reciprocation between said retracted and extended positions;

powered means operatively interconnected to a forward face of said packer for reciprocating said packer between said two positions;

said packer, when occupying said fully extended position, having an upper terminal edge spaced forwardly and downwardly away from a top edge of said opening in said forward end of said tank to define a non-obturated gap therebetween while a major portion of said packer rear face below said upper edge thereof penetrates through said opening and occupies said forward end portion of said tank,

said gap serving to avoid imposition of excessive stresses on roof portions of said tank adjacent to said girth reinforced opening as a reaction from refuse being compacted into said tank by said packer;

said packer having attached thereto a follower plate having a lower edge pivotally connected to said upper edge of said packer to be reciprocable along with said packer;

said follower plate extending forwardly away from said

packer at an angle sloping upwardly and forwardly which varies with extension and retraction of said packer; and

means operatively interconnected between said follower plate and said hopper to vary the slope of said follower plate such that when said packer is fully retracted, said follower plate, said top of said opening into said tank, and upper edge of said opposite side walls of said hopper define an upwardly opening refuse receiving mouth of said hopper,

and when said packer is fully extended the slope of said follower plate is flatter relative to a vertical axis while maintaining an upper edge of said follower plate at about the height of said top of said open end of said tank;

said follower plate when occupying said flatter slope serving to prevent refuse from falling into said hopper in the space between said packer and the forward end of said hopper,

said follower plate occupying a steeper slope when said packer is fully retracted to define the forward side of said refuse receiving mouth of said hopper, said steeper slope serving to permit gravitation from said follower plate of such refuse as may have been deposited thereon when said follower plate occupied said flatter slope.

4,648,776

CONTINUOUS LOADING APPARATUS AND METHOD

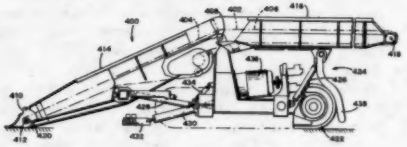
John H. Hradil; Frank Bottomley, both of Delta, and Richard Crawshay, North Vancouver, all of Canada, assignors to Inco Limited, Toronto, Canada

Continuation-in-part of Ser. No. 510,765, Jul. 5, 1983, abandoned, and a continuation-in-part of Ser. No. 326,603, Dec. 2, 1981, abandoned. This application Sep. 12, 1984, Ser. No. 649,857

Claims priority, application Canada, Nov. 6, 1981, 389652; Finland, May 2, 1983, 831492; Norway, May 2, 1983, 831552

Int. Cl.[4] B65G *47/16, 65/06*

U.S. Cl. 414—565 **14 Claims**



1. A mobile continuous loading apparatus disposed on a surface, the apparatus comprising a body having a distal end, a proximal end, a longitudinal axis, a conveyor assembly having an endless conveying surface disposed on the body, the conveyor assembly divided into a proximal section and distal section by a hinge axis disposed transverse to the longitudinal axis, a single, shallow penetrating means cooperating with the proximal section of the conveyor assembly, the penetrating means adapted for introduction into a material pile and for continuously loading the material onto the conveyor assembly, the penetrating means and the proximal section sharing a common horizontal axis transverse to the longitudinal axis, the penetrating means pivotally mounted about the common horizontal axis, first independent means for pivotally oscillating the penetrating means about the common horizontal axis independently of the proximal section, the moving conveying surface circumscribing a returning member, the returning member disposed about the common horizontal axis so that the moving conveying surface rotates about the common horizontal axis, the first independent means adapted to selectively change the inclination of the penetrating means and separately to continuously oscillate the penetrating means through a predetermined arc during loading and conveying of the material, second independent means for changing the inclination of the proximal section of the conveyor assembly through a second arc about the hinge axis to change the vertical position of the penetrating means and separately for selectively causing a downward force on the transverse axis during the continuous oscillation of the penetrating means to react against a substantial portion of the mass of the apparatus, the penetrating means adjustably adapted to lie approximately parallel to or substantially flat on the surface when engaged therewith, and means for advancing the penetrating means.

4,648,777

CONVEYOR COMPRISING A RUNWAY RAIL AND CRAB

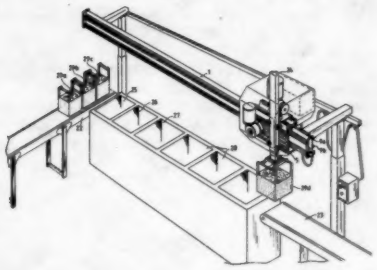
Karl-Friedrich Eichenauer, EV Soest, Netherlands, assignor to Branson Ultrasonics Corporation, Danbury, Conn.

Filed Feb. 25, 1985, Ser. No. 704,661

Claims priority, application European Pat. Off., Jun. 1, 1984, 84106286.2

Int. Cl.[4] B66C *7/08*

U.S. Cl. 414—591 **7 Claims**



1. A conveyor system including a stationary supported runway rail supporting a crab having load wheels and guide wheels, said crab adapted to transport workpieces along said runway rail comprising:

said runway rail including a first rail being in the form of a hollow extruded body having longitudinally extending along its top portion a first outer plane surface and a second outer plane surface serving as respective tracks for load wheels of said crab, said first and second surfaces being angled relative to one another including therebetween a roof angle;

a third outer plane surface and a fourth outer plane surface disposed at the bottom portion of said first rail and extending longitudinally therealong and connected to said top portion of said first rail by respective first and second side flanges;

a second rail in the form of a hollow extruded body of the same configuration as said first rail disposed one above the other in a manner that the first and second outer plane surfaces of the lower rail are in contact with the respective third and fourth plane surfaces of the upper rail,

at least one of said third or fourth surfaces of the lower rail serving as a track for a guide wheel of said crab, said third and fourth surfaces being disposed parallel to said respective first and second surfaces of the upper rail and including therebetween said roof angle;

a set of at least three load wheels coupled to said crab for supporting said crab on said first and second surfaces of the upper rail;

a lateral flange depending from an upper portion of said crab toward the bottom portion of said runway rail, and

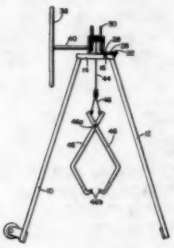
a guide wheel coupled to said lateral flange of said crab for supporting said crab also on one of said third or fourth surfaces of the lower rail, and both said first and second rails being fastened to a cross member by respective first side flanges.

4,648,778

LOG LIFTER

Lester W. Schultz, Rte. 3, Osakis, Minn. 56360

Filed Mar. 29, 1985, Ser. No. 717,671
Int. Cl.[4] B66C 23/60
U.S. Cl. 414—626 5 Claims



1. A log lifter comprising,
a supporting frame including first and second supporting leg structures, each generally defining separate planes and each having upper and lower ends, adapted to receive a log therebetween and extend thereabove;
a top mounting plate fixed to the upper end of the first leg structure and having a top and bottom surface,
a pair of depending flanges fixed in spaced-apart relation to said mounting plate and extending below the bottom surface thereof, said flanges having pivot-receiving openings therein aligned to lie in a plane parallel to the plane of the leg structure to which the mounting plate is fixed,
a hoisting mechanism mounted on the top surface of the mounting plate,
a log gripping unit connected to the hoisting mechanism and disposed below said mounting plate and being adapted to be removably attached to a log to grip the same,
a connecting plate pivotally mounted between said depending flanges and fixed to the top of the second leg structure and arranged with respect to the mounting plate so that a substantial portion of the top surface of the connecting plate engages a substantial portion of the bottom surface of the mounting plate when the two leg structures are in spread-apart relation to rigidly support the two leg structures in spread-apart relation, and
latch means connected with said two plates to positively hold the same in engaged surface-to-surface relation with the leg structures in operative spread-apart relation.

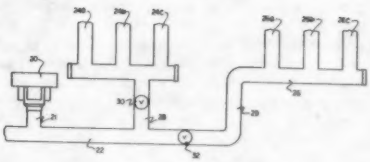
4,648,779

AIR TABLE WITH SELECTIVE AIR DISTRIBUTION

Harry L. Weitzman, White Plains, N.Y., assignor to Jack J. Weitzman, Spring Valley, N.Y.

Filed Jun. 24, 1985, Ser. No. 747,766
Int. Cl.[4] B65G 51/03; B25G 35/00
U.S. Cl. 414—676 2 Claims

1. An air table comprising:
(a) a support frame;
(b) a plurality of modules arranged adjacent each other along the upper portion of said frame, each module including an upper surface having a multiplicity of perforations or openings therein, side walls, and a bottom wall forming an enclosed air plenum therebetween, said bottom wall having an air inlet therein for the introduction of air into said plenum;
(c) a reversible air blower mounted on said frame beneath said modules;
(d) a main air trunk extending from said blower lengthwise of the table;
(e) a plurality of air manifolds attached to and extending longitudinally of said frame, parallel to said main air trunk, each of said air manifolds being shorter in length than said main air trunk and providing air for a plurality of said modules grouped together in a set, each of said manifolds being in close proximity to and serving one of said sets of modules, a plurality of air feed lines extending from each of said manifolds transversely across said frame beneath one of said modules, each of said air feed lines connecting said air inlet in the bottom wall of one of said plenums with the corresponding manifold;
(f) a transversely extending branch line means connecting said main air trunk with each of said air manifolds for



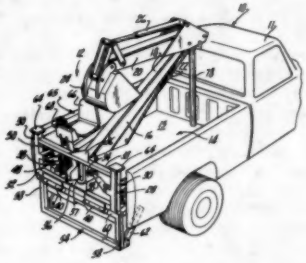
delivering air from said main air trunk to pressurize each of said air manifolds;
(g) an on-off valve upstream of each manifold and between the corresponding manifold and the main air trunk serving the other manifolds for selectively connecting and disconnecting the flow of air thereinto;
(h) whereby sets of modules in said air table may be selectively activated and deactivated with a flow of air separate from other of said sets of sections.

4,648,780

TRUCK MOUNTED BACKHOE

John R. Harms, and Ronald L. Anderson, both of Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed Aug. 26, 1985, Ser. No. 769,035
Int. Cl.[4] B66F 9/00
U.S. Cl. 414—686 5 Claims



1. An implement mounting system for use on a truck having an open cargo bed, said implement mounting system comprising:
a sub-frame mounted on said truck bed;
a support frame pivotally mounted to said sub-frame adjacent a rear portion of said bed, said support frame having opposed side members and pivot means operatively supporting a boom, said frame being pivotable between a use position wherein said side members extend downwardly substantially perpendicular to said bed with said boom extendable rearwardly for use and a transport position wherein said side members extend upwardly substantially

perpendicular to said bed with said boom being foldable over said bed for transport;

at least one linkage means interconnected between said sub-frame and said support frame, said likage means having first and second link members pivotally joined at one end with the opposite end of said first link member being pivotally connected to said sub-frame and the opposite end of said second link member being pivotally connected to one of said side members;

a piston cylinder connected at one end to said one end of said linkage members and pivotally connected at the opposite end to said sub-frame, said cylinder operable to push and pull the support frame between said use and said transport positions; and

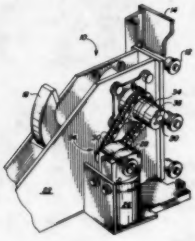
a control station positioned adjacent the rear of said truck bed operatively controlling said implement in both said use and transport positions and operatively controlling said support frame between said use and transport positions.

4,648,781

AUTOMATIC CONTROL SYSTEM FOR A RELEASABLE VEHICLE LOCKING DEVICE

Scott T. Sikora, Mesa, Ariz., assignor to Tomar Electronics, Inc., Tempe, Ariz.

Filed May 29, 1985, Ser. No. 738,873
Int. Cl.[4] B65G *69/00*
U.S. Cl. 414—401 **17 Claims**



1. An automatic control system for a releasable locking device which secures a parked vehicle to an adjacent structure including

i. a hook for engaging a coupling on the vehicle;

ii. means for actuating said hook into a locked position where said hook engages said coupling or into an unlocked position where said hook clears said coupling; and

iii. hook position sensor means for sensing whether said hook is in the locked, the unlocked or an unsafe position between the locked and unlocked positions;

wherein said automatic control system comprises:

a. hook position selector means for generating lock or unlock signals in response to a hook position command selected by an operator and for storing the selected hook position command;

b. first actuator control means for energizing said hook actuator means for a predetermined time interval to reposition said hook into the locked position in response to the lock signal;

c. second actuator control means for energizing said hook actuator means to reposition said hook into the unlocked position in response to the unlock signal;

d. hook position correction means coupled to said hook position sensor means and to said hook position selector means for comparing actual hook position with the selected hook position and for switching into a hook sag correction mode to generate a hook lock signal when the lock position has been selected and the hook is displaced into the unsafe position to automatically energize said hook actuator means for repositioning said hook from the unsafe position back into the selected, locked position; and

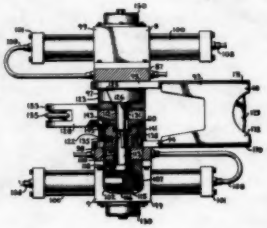
e. control means for sensing the stored hook position command and the output of said hook position sensor means, for comparing the stored hook position command with the hook position at the end of the predetermined time interval, and for disabling said hook position correction means if the hook position at the end of the predetermined time interval is either unlocked or unsafe.

4,648,782

UNDERWATER MANIPULATOR SYSTEM

Brett W. Kraft, 7300 Springfield, Prairie Village, Kans. 66208

Filed May 27, 1983, Ser. No. 498,878
Int. Cl.[4] B25J *13/00*
U.S. Cl. 414—735 **6 Claims**



1. A manipulator device comprising:

(a) a base for connection to a manipulator support and having a base pivot;

(b) a shoulder arrangement mounted on said base through said base pivot and having an hydraulic power manifold forming a body of said shoulder arrangement, with said shoulder arrangement including an azimuth control means and actuator, an elbow control means and actuator; and an upper arm control means and actuator all mounted to said body and rotatable therewith on said base pivot;

(c) an upper arm member swingably connected to said shoulder arrangement and operably connected to said upper arm control means and actuator;

(d) a forearm member swingably connected to said upper arm member at an elbow joint and operably connected to said elbow control means and actuator;

(e) a wrist assembly and actuators therefor mounted to a distal end of said forearm member;

(f) a gripper assembly and actuators therefor mounted to a distal end of said wrist assembly;

(g) a pivot mechanism connecting said upper arm to said shoulder arrangement;

(h) said pivot mechanism having opposite ends with said upper arm elevation control means and actuator connected to one end and said elbow elevation control means and actuator connected to the other end and respectively and selectively rotating said pivot mechanism;

(i) said pivot mechanism including a split shaft having coaxial half shafts with one half shaft rotatably connected to said upper arm elevation control means and the other half shaft rotatably connected to said elbow elevation control means; and

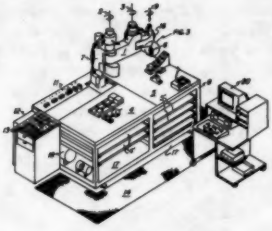
(j) said other half shaft having a lever arm secured thereto and extending outwardly and having said linkage rod pivotally connected thereto for push-pull movement as said other half shaft rotates.

4,648,783

EDUCATIONAL AND LABORATORY WORK CELL FOR A ROBOTIC DEVICE

Patrick Tan, 8651 NW. 1st, Coral Springs, Fla. 33065; Peter Maitland, 1821 SE. 21st Ave., Pompano Beach, Fla. 33062; Gregory Kawczynski, 5620 NE. 18 Ave., Apt. 4, Fort Lauderdale, Fla. 33334, and Paul V. Camposeo, 6875 NW. 9th St., Margate, Fla. 33063

Filed Nov. 6, 1984, Ser. No. 668,747
Int. Cl.[4] B25J *9/00*
U.S. Cl. 414—730 12 Claims



1. A robotic cell for educational and laboratory work, comprising:

a support table having a frame and upper surface means for supporting selected objects, said frame supporting said upper surface means;

a robot having moveable arm means, said robot mounted to said support table, said arm means for manipulating said selected objects on said upper surface means;

said upper surface means including at least one removable modular section, said removable modular section readily interchangeable with one of a plurality of modular sections;

said support table including housing means, said housing means storing a plurality of modular sections beneath said upper surface means;

each of said plurality of modular sections capable of supporting a discrete group of selected objects;

whereby said plurality of interchangeable modular sections allow quick and efficient transposing of selected objects subject to manipulation by said robot arm means.

4,648,784

DRIVE PROTECTION DEVICE CONNECTABLE BETWEEN TWO PORTIONS OF A DRIVEN OPERATING DEVICE

Kurt Wiedemann, and Werner Schwarz, both of Augsburg, Fed. Rep. of Germany, assignors to Kuka Schweissanlagen + Roboter GmbH, Fed. Rep. of Germany

Filed May 17, 1985, Ser. No. 735,343
Claims priority, application Fed. Rep. of Germany, May 19, 1984, 3418720
Int. Cl.[4] B25J *9/00*
U.S. Cl. 414—730 13 Claims

1. A safety device for a manipulator having a first constructional part and a second constructional part operatively connected to said first constructional part, with a drive for moving the second constructional part, comprising:

said first constructional part carrying a circumferential guide surface;

casing means connected to said second constructional part for defining a plurality of circumferentially spaced guideways each extending toward said circumferential guide surface;

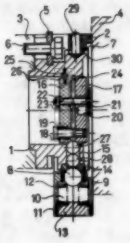
a plurality of centering balls each disposed for movement in one of said guideways;

ball biasing means biasing each of said centering balls toward and into engagement with said circumferential guide surface for holding said first constructional part in a centered position with respect to said second constructional part;

a pair of operating disks disposed in said first constructional part;

coaxial guide means connected between said operating disks for holding said operating disks coaxially to each other while permitting movement of said operating disks toward and away from each other;

a plurality of spacer elements held by said first constructional part and circumferentially spaced around said operating disks, said spacer elements each engaged against said operating disks for holding said operating disks apart;



switch means operatively connected to said operating disks and adapted for connection to the manipulator drive for deactivating the manipulator drive when a distance between said operating disks changes; and

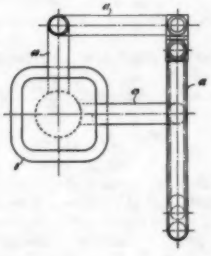
a plurality of connecting members each held for radial movement of said first constructional part and each engaged between one of said centering balls and one of said spacer elements so that, when said first constructional part moves out of said centered position with respect to said second constructional part in any direction, said centering balls urge said spacer elements to move through said connecting members to change the spacing between said operating disks so as to activate said switch means and deactivate the manipulator drive.

4,648,785

INDUSTRIAL ROBOT EMPLOYING DIRECT DRIVE OPERATION

Tohru Nakagawa; Yasuo Sakurai, and Yoshiaki Makizawa, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Nov. 18, 1985, Ser. No. 799,165
Claims priority, application Japan, Nov. 19, 1984, 59-243760
Int. Cl.[4] B25J *18/00*
U.S. Cl. 414—744 A 2 Claims



1. A direct drive operation robot having a closed loop parallel link arm, comprising:

a base;

a supporting pillar fixedly mounted on said base;

a first prime mover which is supported by said supporting pillar and includes a drive shaft;

a second prime mover which is supported by said supporting pillar and includes a drive shaft which is coaxial with said first prime mover drive shaft, said second prime mover being adapted to be driven independently of said first prime mover;

a first arm which is directly coupled at one end thereof to said drive shaft of said first prime mover, a second arm which is rotatably coupled at one end thereof to the other end of said first arm, a third arm which is rotatably coupled at one end thereof to the other end of said second arm, and a fourth arm which is of identical length to said second arm and which is rotatably coupled at one end thereof to said third arm at a position on said third arm which is at a distance from said coupling position of said second arm and third arm that is equal to said length of said first arm, and which is directly coupled to said drive shaft of said second prime mover at the other end thereof, said first arm, second arm, third arm and fourth arm being thereby rotatable in directions parallel to a fixed plane by selective driving of said first prime mover and second prime mover;

a hand mechanism including a plurality of drive shafts, mounted on said third arm at the opposite end of said third arm to said position at which said second arm and third arm are coupled, such that said coupling position of said third arm and fourth arm is disposed between said hand mechanism and said coupling position of said second arm and third arm;

a controlled member mounted on said hand mechanism for movement relative to said third arm;

at least one prime mover which is fixedly mounted on said third arm at a position which satisfies an equation given below, at a position on the opposite end of said third arm to said hand mechanism, and;

motive power transmission means coupled between said prime mover mounted on said third arm and said hand mechanism, for driving said hand mechanism to produce movement of said controlled member relative to said third arm; in which said equation is:

$$m_3l_1h_2 \simeq m_3l_2h_3$$

where l_1 is the length of said first arm, l_2 is the length of each of said fourth arm and said second arm, m_1 is the mass of said first arm, m_2 is the mass of said second arm, m_3 is the sum of the masses of said third arm, said prime mover which is fixedly attached to said third arm, said hand mechanism and controlled member, and said motive power transmission means, h_2 is the distance from the position at which said first arm and second arm are coupled to the position of the center of gravity of said second arm, h_3 is the distance from the coupling position of said third arm and fourth arm to the center of gravity of the system consisting of said third arm, said prime mover which is fixedly attached to said third arm, said hand mechanism, and said motive power transmission means, with said distance being measured along said third arm in a direction extending towards said hand mechanism.

4,648,786

PRESS MACHINE

Terushige Sakurai, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 9, 1982, Ser. No. 448,173

Claims priority, application Japan, Dec. 15, 1981, 56-185727[U]; Dec. 15, 1981, 56-185728[U]; Dec. 15, 1981, 56-185729[U]

Int. Cl.⁴ B25J *15/06*

U.S. Cl. 414—752 **2 Claims**

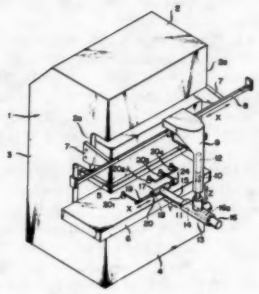
1. A transfer device for use in a press machine to infeed workpieces for work, to advance workpieces from one workstation to another, and to outfeed finished workpieces comprising:

a longitudinal extending rail mounted in front of a body of said press machine by means of brackets fixedly secured, respectively, to side faces of said press machine body, said brackets being arranged to project outwardly along said side faces;

a main body located in front of said press machine body and movable along said rail;

a lift member mounted on said main body so as to be movable in a vertical direction;

a transfer means fitted to said lift member so as to be movable backwardly and forwardly with respect to the longitudinal direction of said press machine body to infeed workpieces for work, to advance workpieces from one workstation to another, and to outfeed finished workpieces, said transfer means including holder means and a plurality of transfer members arranged in spaced-apart relation in a longitudinal direction of a bed of said press



machine and mountable in said holder means, said plurality of transfer members consisting of two groups of said transfer members, a first group of which is adjustable along said longitudinal direction of said bed with respect to a second group such that the space interval between one of said groups with respect to the other is adjustable as said main body is moved along said rail, whereby said transfer means can provide a different length of infeed transfer and a different length of outfeed transfer during a single longitudinal stroke, while maintaining the ability to transfer workpieces from one workstation to another, all in a direction along the longitudinal direction of said press bed, at least one of said transfer members being detachably stowable on said press machine body so as to be freely attachable and detachable to said transfer means by moving said holder means backwardly and forwardly with respect to said press machine body; and

drive means for driving said main body, said lift member and said transfer means respectively.

4,648,787

APPARATUS FOR TRANSPORTING AND/OR MIXING GASES

Matthias A. M. Brünig, Diekbarg 48, D-2000 Hamburg 65, and Werner G. Möller, Steendammwisch 53, D-2000 Hamburg 61, both of Fed. Rep. of Germany

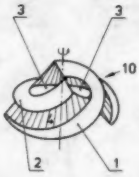
PCT No. PCT/EP85/00057, § 371 Date Sep. 11, 1985, § 102(e) Date Sep. 11, 1985, PCT Pub. No. WO85/03745, PCT Pub. Date Aug. 29, 1985

PCT Filed Feb. 20, 1985, Ser. No. 777,981

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1984, 3406868

Int. Cl.[4] F04D *1/04*

U.S. Cl. 415—72 3 Claims



1. A fluid transport apparatus, comprising:
(a) a solid baffle plate (11), and
(b) a generally conical propeller (10) rotatably mounted closely proximate the baffle plate and axially perpendicular thereto, an apex portion of the propeller being oriented in a direction facing away from the baffle plate, and the propeller comprising:
(1) at least two helicoidal blades (1, 2) equally spaced around a circumference of the propeller and spiralling inwardly towards the apex portion with leading edges of the blades disposed side by side at said apex portion and on opposite sides of the propeller axis, and
(2) at least two helical guide panels (4) interconnecting the blades such that the leading edges of the blades are disposed inwardly of the guide panels at the apex portion and trailing edges of the blades are disposed outwardly of the guide panels at an open bottom, base portion of the propeller, the blades and panels thus defining a convolute propeller configuration with a pair of oppositely oriented entry apertures (3) at the apex portion such that fluid is drawn in through the apertures, screw pumped downwardly and outwardly within the propeller toward the base portion, and expelled outwardly therefrom against the baffle plate, the expelled fluid being deflected outwardly by the baffle plate to flow across a surface thereof and transportingly entrain additional fluid surrounding the propeller.

4,648,788

DEVICE IN FLUID PRESSURE GENERATORS

Philip Jochum, Odinslundsvägen 1 E, S-517 00 Bollebygd, Sweden

PCT No. PCT/SE85/00028, § 371 Date Sep. 17, 1985, § 102(e) Date Sep. 17, 1985, PCT Pub. No. WO85/03270, PCT Pub. Date Aug. 1, 1985

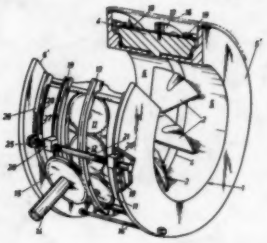
PCT Filed Jan. 25, 1985, Ser. No. 777,781

Claims priority, application Sweden, Jan. 26, 1984, 8400381

Int. Cl.[4] B63H *25/42*

U.S. Cl. 415—91 6 Claims

1. An improved fluid pressure generator comprising an outer housing defining a through flow channel, an annular casing peripherally mounted for rotation in said outer housing, said annular casing having an inner face forming part of the wall of said through-flow channel, and a number of propeller blades provided on said annular casing, said blades projecting radially inwards into said fluid through-flow channel, and means for rotating said annular casing and said propeller blades about an axis extending through said through-flow channel the improvement comprising a shaft pin on each one of said propeller blades journaled within said annular casing, a regulating mechanism arranged to turn said propeller blades simultaneously about their individual shaft pin for changing the pitch thereof, said regulating mechanism being independent of the rotary drive of said annular casing, said annular casing having a substantiallv lesser length than the length of said of through-flow channel, said propeller blades tapering radially outwardly of said flow channel and defining their wider portion contiguous to said shaft pins, said shaft pins and said annular casing a substantially lesser length than the largest width of said propeller blades.



4,648,789

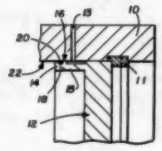
SEALING MEANS FOR A CYLINDRICAL PUMP CASE OR THE LIKE

Dennis G. Bowman, Whittier, Calif., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 503,450, Jun. 13, 1983, which is a continuation-in-part of Ser. No. 179,399, Aug. 19, 1980, abandoned. This application May 10, 1985, Ser. No. 732,752

Int. Cl.[4] F04D *29/08*

U.S. Cl. 415—110 9 Claims



1. In a pump and the like including a case having a generally cylindrical bore therein extending through at least one end of said case and a head member for closing said bore, improved seal means for preventing fluid flow between said head member and case, said improvement comprising:
annular means located within said bore and supported by said head, said annular means including a seal support portion adjacent to said case that is substantially thinner and more flexible than said case adjacent to said head member, said flexible portion means having an annular groove therein adjacent to said case;
a resilient annular seal member located in said groove in fluid-tight sealing relationship with said case and with said annular means; and,
said flexible portion of said annular means moving in response to pressure in said case into engagement with said case to prevent extrusion of said annular seal member out of said groove.

4,648,790

AXIAL TURBINE FOR EXHAUST GAS TURBOCHARGERS

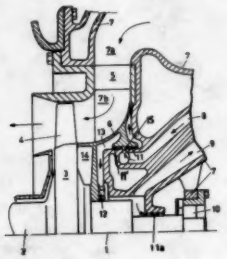
Hansulrich Hörler, Zürich, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jun. 21, 1984, Ser. No. 623,199

Claims priority, application Switzerland, Jun. 29, 1983, 3559/83

Int. Cl.[4] F01D *9/02*

U.S. Cl. 415—112 **8 Claims**



1. In an axial turbine for exhaust gas turbochargers of the type including a turbocharger shaft, a turbine rotor connected to the turbocharger shaft, said turbine rotor having a turbine disc and axial flow turbine rotor blades connected to the turbine disc, a turbine casing in which the turbine shaft is supported, a ring of radial flow turbine guide vanes located in the turbine casing upstream of the rotor blades and a rotationally symmetrical exhaust gas deflection duct located between the turbine guide vanes and the turbine rotor blades, said turbine guide vanes tangentially accelerating exhaust gases entering said deflection duct, the improvement comprising a radially inner wall of the rotationally symmetrical exhaust gas deflection duct being a deflection collar which collar is bladeless and rigidly connected with the turbocharger shaft so as to rotate with it, whereby friction between the exhaust gases and said deflection duct is reduced.

4,648,791

ROTOR, CONSISTING ESSENTIALLY OF A DISC REQUIRING COOLING AND OF A DRUM

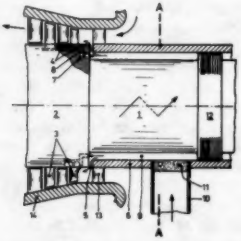
Franz Kreitmeier, Baden, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed May 29, 1985, Ser. No. 738,788

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1984, 3424139

Int. Cl.[4] F01D *5/08*

U.S. Cl. 415—116 **10 Claims**



1. In a rotor assembly of the type including a rotatable disc requiring cooling, a rotatable drum, a cover surrounding the drum so as to provide an annular space between the cover and the drum, and a radial supply line for introducing cooling medium into the annular space from a circumferentially fixed location on said rotor assembly, said drum rotatable relative to said radial supply line, wherein the improvement comprises a deflector cascade provided in the radial supply line, said deflector cascade having an outlet end and vanes directed at the outlet end in a rotational direction of the drum, whereby the cooling medium is deflected in the rotational direction of the drum when introduced into the annular space.

4,648,792

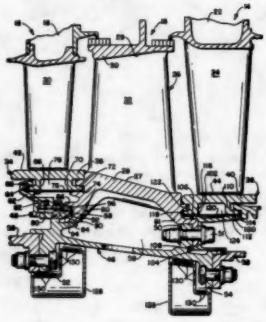
STATOR VANE SUPPORT ASSEMBLY

Walter J. Baran, Jr., S. Glastonbury; Gary F. Chaplin, Vernon, and Vincent P. Laurello, Guilford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 30, 1985, Ser. No. 728,951

Int. Cl.[4] F01D *25/28*

U.S. Cl. 415—139 **2 Claims**



1. A vane and outer air seal assembly for a gas turbine engine comprising:

a one piece annular case having an axis and a radially inwardly extending annular attachment ring, said ring having a rearwardly extending first cylindrical projection and a rearwardly extending second cylindrical projection spaced rearwardly of said first projection, said second projection having a radially inwardly facing cylindrical surface;

a plurality of stator vane units disposed circumferentially about said axis radially inwardly of said case, each unit comprising an arcuate outer wall, said outer walls being in circumferentially abutting relationship defining a radially inwardly facing portion of a gas flow path, each wall having at least one airfoil extending radially inwardly therefrom, each outer wall having a front end, a front foot integral with and extending radially outwardly from said front end, and a rear foot integral with and extending radially outwardly from said rear end, each of said front feet comprising a forwardly facing first arcuate groove, said first grooves defining a first annular groove, said assembly including means for fixing each of said rear feet to said case for preventing axial movement of said stator vane units relative to said case;

annular outer air seal means comprising a plurality of adjacent, circumferentially disposed, arcuate, axially extending seal segments defining a radially inwardly facing portion of a gas flow path, each segment having a front end and a rear end, said rear end of each segment sealingly engaging and radially supported and located by said front end of said outer wall of at least one of said vane units; and

support means interconnecting said front end of each seal segment and said attachment ring, said support means including a plurality of arcuate, circumferentially disposed support segments defining an annular wall, each support segment having a radially inner end engaging said front end of at least one of said seal segments for fixing the

radial position of said seal segment front end relative to said support segment, each support segment having a radially outer end, said outer end including an arcuate, forwardly facing groove, said forwardly facing grooves of said support segments defining a second annular groove, each support segment outer end also including a rearwardly extending arcuate projection spaced rearwardly of said second annular groove and having a radially outwardly facing surface in mating contact with said inwardly facing cylindrical surface of said second cylindrical projection of said attachment ring;

said second cylindrical projection and said rearwardly extending arcuate projection being tightly disposed within said first annular groove for radially locating said vane unit feet relative to said attachment ring; and

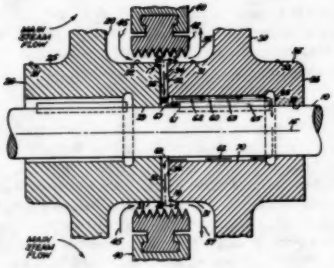
said first cylindrical projection being tightly disposed within said second annular groove for fixing said support segments radially relative to said attachment ring.

4,648,793

TURBINE WHEEL KEY AND KEYWAY VENTILATION

Edward H. Miller, Rexford, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 31, 1985, Ser. No. 739,728
Int. Cl.[4] F01D *25/32*
U.S. Cl. 415—168 **21 Claims**



1. In a fluid flow turbine including a rotatable shaft and at least one wheel fixedly coupled to the shaft, the at least one wheel including a surface defining a bore for receiving the shaft and having a first part of a substantially axially extending keyway terminating at the surface of the wheel and the shaft having a second part of the keyway terminating at the periphery of the shaft, the first and second part of the keyway when appropriately registered for receiving a key, ventilation means for ventilating the keyway and the key to be disposed therein comprising:

first fluid flow communication means coupled to the keyway for providing fluid flow communication between the keyway and a first location on an axial end of the at least one wheel; and

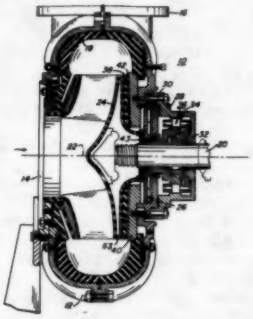
second fluid flow communication means coupled to the keyway for providing fluid flow communication between the keyway and a second location on the axial end of the at least one wheel such that at least part of the keyway forms a portion of the fluid flow communication from the first location to the second location.

4,648,794

PUMP WITH HIGH SPEED EXPELLER

Harjit S. Hunjan, Douglas County, and Daryl P. Jones, Woodland Park, both of Colo., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed May 3, 1985, Ser. No. 730,143
Int. Cl.[4] F04D *29/08*
U.S. Cl. 415—170 B **10 Claims**



1. In a liquid pump having an inlet, an outlet, a shaft and affixed impeller rotatable to create a first head moving liquid from said inlet to said outlet and a rotatable expeller for creating a second head for redirecting liquid leakage behind said impeller toward said outlet, said expeller being of smaller outer diameter than said impeller, the improvement comprising:

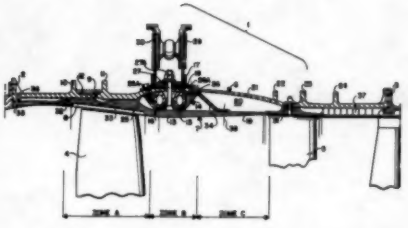
means for rotating said expeller at a rotational velocity greater than the rotational velocity of said shaft and affixed impeller so as to form said second head at a pressure greater than said first head.

4,648,795

CONTAINMENT STRUCTURE FOR A TURBOJET ENGINE

Alain M. J. Lardellier, Melun, France, assignor to Societe Nationale d'Etude et de Construction de Meteur d'Aviation "S.N.E.C.M.A." , France

Filed Dec. 6, 1985, Ser. No. 805,799
Claims priority, application France, Dec. 6, 1984, 84 18593
Int. Cl.[4] F04D *29/54*
U.S. Cl. 415—196 **5 Claims**



1. A containment structure for a turbojet having at least one turbine rotor blade wheel within an engine housing comprising:

(a) a metallic outer casing attached to the engine housing, the outer casing having a generally annular shape and extending in an axial direction both upstream and downstream from a plane of rotation of the rotor blade wheel;

(b) an inner liner having a generally annular shape and ex-

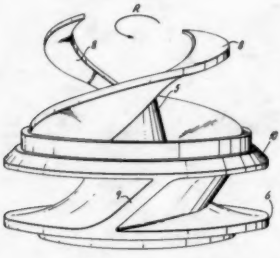
tending in an axial direction both upstream and downstream from a plane of rotation of the rotor blade wheel;
(b) an inner liner having a generally annular shape and extending in an axial direction both upstream and downstream from the plane of rotation of the rotor blade wheel;
(c) a sealing ring disposed on the inner liner in a first zone located in the plane of rotation of the rotor blade wheel;
(d) a retention belt structure disposed between the outer casing and the inner liner and extending around the circumference of the inner liner in a second zone downstream of the first zone the retention belt structure comprising:
(i) a pair of toroid retention members; and,
(ii) means to attach the toroid retention member to the outer casing;
(e) a retention chamber defined between the outer casing and the inner liner in a third zone downstream of the second zone;
(f) means to removably attach the inner liner to the outer casing;
(g) first, second and third annular bearing surfaces defined on an inner surface of the outer casing located upstream of the second zone, the diameters of the bearing surfaces decreasing in the downstream direction;
(h) fourth, fifth and sixth annular bearing surfaces defined on an outer surface of the inner lining located upstream of the second zone, the diameters of the bearing surfaces decreasing in the downstream direction, the fourth, fifth and sixth bearing surfaces located so as to contact the first, second and third bearing surfaces, respectively, when the inner liner is assembled with the outer casing;
(i) a retaining fitting disposed in the retention chamber;
(j) means to attach the retaining fitting to the outer casing and the inner liner, wherein the means to attach the retaining fitting to the inner liner is located in the third zone;
(k) a pair of flanges extending radially outwardly from the outer casing in the first zone; and,
(l) a retention ring disposed about the outer casing between the radial flanges.

4,648,796

CENTRIFUGAL PUMP FOR VERY THICK AND/OR VISCOUS MATERIALS AND PRODUCTS

Tersillo Maghenzani, Parma, Italy, assignor to Pompe F.B.M. S.p.A., Parma, Italy

Filed Jun. 29, 1984, Ser. No. 625,917
Claims priority, application Italy, Jul. 6, 1983, 46850 A/83
Int. Cl.[4] F04D 7/04
U.S. Cl. 415—215 **5 Claims**



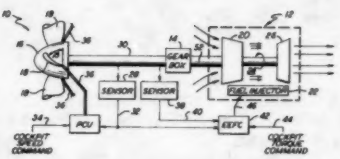
1. A centrifugal pump for conveying very thick and/or viscous materials and products comprising
a casing which defines a frusto-conical operating chamber provided with a suction port and a delivery volute,
a screw impeller rotatably mounted in the operating chamber, the first portion of its blade extending in the form of a helix with a slightly conical outer profile, the pitch of said blade increasing from upstream to downstream with the orientation of the helix surface varying accordingly from nearly horizontal to nearly vertical, said screw impeller being wound about a highly conical core which smoothly joins into a base disc, orthogonal to the axis of rotation, the last portion of the impeller blade being twisted by bending towards the core to assume the form of a delivery vane which is superimposed by a ring which is rigid therewith and forms an acute angle with the base disc, and is orientated along a chord which is very close to the circumferential edge of the base disc, said highly conical cone cooperating with the slightly conical wall of the casing to define passages of decreasing cross-sections which functions to increase the speed of the materials being conveyed therethrough.

4,648,797

TORQUE CONTROL SYSTEM

Anthony N. Martin, Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1983, Ser. No. 562,794
Int. Cl.[4] B64C 27/57
U.S. Cl. 416—27 **13 Claims**



1. Apparatus for providing a signal for controlling the output torque of a prime mover driving a load in a system having rotating parts of known rotational inertia including an output shaft controlled at a commanded torque value, the output shaft controlled at a commanded angular velocity by controlling the load absorbing capacity of the load, the system having signals associated therewith having magnitudes indicative of the actual angular velocity, a commanded torque value and an actual sensed torque value, comprising:
means responsive to changes in the actual angular velocity signal for providing a load torque transient signal indicative of the presence of a changing load torque, said load torque transient signal having a present value indicative of the present value of said changing load torque; and
summing means, responsive to said torque transient signal, to the commanded torque signal and to the sensed torque signal for adding the present values thereof for providing a prime mover output torque error signal compensated for load torque transients for controlling the output torque of the prime mover.

4,648,798

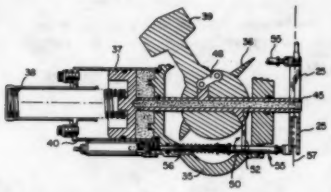
CONTROLLABLE PITCH AIRCRAFT PROPELLER

Walter B. Voisard, Beavercreek, Ohio, assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed May 1, 1985, Ser. No. 729,438
Int. Cl.[4] B64C 11/38
U.S. Cl. 416—48 **7 Claims**

1. In a variable pitch hydraulic aircraft propeller in which at least a portion of the propeller pitch range is controlled directly by the pilot by manipulating a fluid control valve, and in which a blade yoke in a propeller hub is positioned by the blades to move a feedback mechanism including a beta feedback rod for repositioning the fluid control valve in accordance with the position of the blades, the improvement for effecting a blade shift into a low pitch position through an angle which exceeds that available to the pilot by selecting a ground idle range, comprising means on said feedback rod forming a movable stop, means on said movable stop engage-

able by said blade yoke, said movable stop being movable between a normally seated position and a moved position, spring means biasing said stop into said normally seated position, said stop being positioned on said rod so as to be engaged by said yoke upon the selection of a ground idle position by the pilot and movable against said spring means to said moved



position by movement of said blades under the control of said valve without accompanying movement of said feedback rod providing for a shifting of said blades to a lower pitch position and thereafter providing for the reclosing of said fluid control valve following the interruption of said movement of said feedback rod.

4,648,799

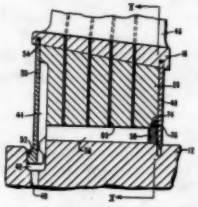
COOLED COMBUSTION TURBINE BLADE WITH RETROFIT BLADE SEAL

David L. Brown, Medfield, Mass., and Leroy D. McLaurin, Springfield, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 550,058, Nov. 8, 1983, abandoned, which is a continuation of Ser. No. 304,760, Sep. 22, 1981, abandoned. This application Sep. 5, 1984, Ser. No. 647,859

Int. Cl.⁴ F01D *5/18, 5/32*

U.S. Cl. 416—95 **4 Claims**



1. A cooled turbine blade assembly adapted for installation on a rotor disc (1) having axially extending serrated slots provided about the disc periphery to receive serrated blade root portions in mating engagement; and (2) having means for providing a flow of cooling air through a plenum chamber in each blade root slot between each blade root and the disc;

said blade assembly comprising a blade having an airfoil portion and a root portion engageable with the disc in one of the slots and means for conducting cooling fluid from the plenum chamber beneath the root portion through the root portion and the airfoil portion and into an exhaust path to the motive axial fluid surrounding the airfoil portion;

a separate sealing member having an upper portion thereof engaged against a side portion of said blade root portion to prevent sealing member axial movement and a lower portion thereof disposed in and contoured closely with the associated serrated disc slot to close off the plenum chamber on the blade downstream side;

said upper portion being shaped to fit closely within a notched corner of a radially innermost serration of the blade root, so that the upper portion of said sealing member is generally continuous with the blade root;

said lower portion being shaped in the radial plane to closely fit and fill the space between the walls of the plenum chamber and dimensioned in the axial plane to a thickness which is less than the radial dimension of the lower portion; and

side plate means engaged against said blade and said sealing member to lock the same in place.

4,648,800

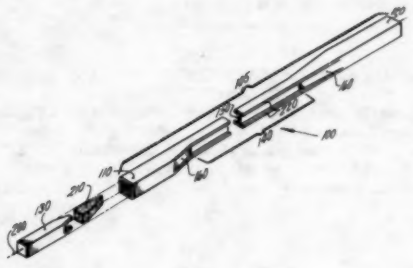
COMPOSITE FLEXBEAM FOR A ROTARY WING AIRCRAFT

Evan A. Fradenburgh, Fairfield; Edmond F. Kiely, Stratford, and Gordon G. Miller, Shelton, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 15, 1984, Ser. No. 610,370

Int. Cl.⁴ B64C *11/26*

U.S. Cl. 416—134 A **4 Claims**



1. A fiber reinforced composite flexbeam for mounting a variable pitch blade to a rotatable hub thereof, said flexbeam being characterized by a unitary outer structure of continuous, fiber reinforced, thermosetting epoxy resin material having torsionally stiff, thick inboard and outboard end portions, each of which end portions tapers down to a torsionally soft, thin, solid, medial web portion, wherin the end portions are reinforced with reinforcing doublers.

4,648,801

WIND TURBINES

Robert R. Wilson, Kilmalcolm, Scotland, assignor to James Howden & Company Limited, Glasgow, Scotland

Filed May 21, 1986, Ser. No. 868,190

Claims priority, application United Kingdom, Sep. 20, 1982, 8226674

Int. Cl.⁴ F03D *9/02*

U.S. Cl. 416—171 **5 Claims**

1. A wind turbine assembly comprising a tower, a head mounted on the upper end of said tower for swivelling about a

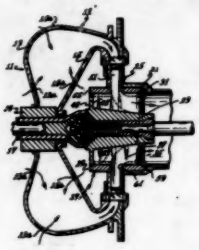
vertical axis, a duct extending upwardly within said tower, and having an upper end and a lower end, a swivel joint between said head and the upper end of said duct, a wind turbine mounted on said head and having blades thereon, an air compressor mounted in said head, with the axis of the wind turbine and compressor being substantially horizontal, means operatively connecting the air compressor to the turbine, whereby the compressor is driven thereby, an air inlet and an air outlet of said compressor, said air inlet being positioned downstream and sufficiently close to said blades and of a size effective to remove a substantial quantity of air from the axial flow airstream in the vicinity of said blades of said wind turbine thereby significantly to improve the efficiency of said turbine, the outlet of the compressor being connected to said swivel joint, whereby air under pressure from said air compressor can be fed down said duct to the lower end thereof and a reservoir connected to said lower end of the duct, effective to receive air under pressure from said compressor, said head being allowed to swivel, so that the wind turbine can face the wind.

4,648,802

RADIAL FLOW ROTOR WITH INSERTS AND TURBINE UTILIZING THE SAME

Thomas E. Mack, Villa Park, Calif., assignor to PDA Engineering, Santa Ana, Calif.

Filed Sep. 6, 1984, Ser. No. 648,010
Int. Cl.[4] B63H *1/28*; B64C *11/14*; F01D *5/00*; F03B *1/02*
U.S. Cl. 416—244 A **4 Claims**



1. A rotor for high temperature and high speed applications comprising:

a rotatable hub having a plurality of circumferentially spaced slots;

a plurality of blades, each of said blades having a mounting portion, said mounting portions being received in said slots, respectively, whereby the blades rotate with the hub, said blades being adapted to have high-temperature gases pass thereover; a shroud coupled to the hub and rotatable therewith, said shroud extending over said slots and said mounting portions whereby centrifugal force resulting from the mass of the shroud places the shroud in hoop tension and centrifugal force resulting from the mass of the blades places local forces on the shroud that tend to locally deform the shroud radially of each of the blades to place the shroud in shear;

said shroud being constructed of a composite material arranged so that the shroud is stronger in hoop tension than in said shear;

means responsive to rotation of the hub for applying a centrifugal force to the shroud between said blades to cause the shroud to be more evenly deformed to thereby reduce said shear; and

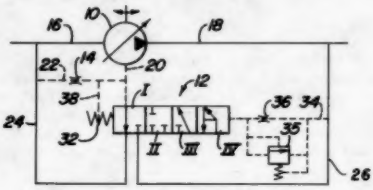
each of said blades having a radial segment extending generally radially outwardly, said shroud having an inlet segment and an outlet segment on opposite sides of the radial segments of the blades, and a plurality of centrifugal members between the hub and the shroud, some of said members being one one side of said radial segments of said blades and the other of said members being on the other side of said radial segments of said blades, and each of said members being between an adjacent pair of said blades.

4,648,803

CONTROL CIRCUIT AND CONTROL VALVE FOR RADIAL PISTON PUMP

Dwight B. Stephenson, Hudson, and Glenn R. Wendel, Gilbertville, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Sep. 17, 1985, Ser. No. 779,368
Int. Cl.[4] F04B *49/00*
U.S. Cl. 417—53 **18 Claims**



1. A control circuit for a reciprocating piston pump having a stroke control chamber for destroking said pump, by increasing the pressure in the stroke control chamber, to directly bias the pistons and vary displacement of the pistons, said circuit comprising:

a first passage communicating said stroke control chamber with the inlet of said pump;

a second passage communicating the outlet of said pump with said stroke control chamber;

a third passage communicating said first passage with said second passage; and

means for blocking fluid flow in said second and third passages when the output pressure of said pump is below a first predetermined value and blocking fluid flow in said first and second passages when said output pressure is intermediate said first value and a second predetermined pressure value in excess of said first value.

17. A method for controlling the destroking of a reciprocating piston pump having a stroke control chamber for destroking said pump by increasing the pressure in the stroke control chamber, to directly bias the pistons and vary displacement of the pistons, and sufficient fluid leakage from the piston chambers of said pump to the stroke control chamber to at least partially destroke the pump, said method comprising:

sensing output pressure from said pump;

allowing unrestricted fluid flow from said stroke control chamber to the inlet of said pump while said output pressure remains at or below a predetermined value; and

restricting fluid flow from said stroke control chamber when said output pressure exceeds said predetermined value by an amount sufficient to raise the pressure in said stroke control chamber to cause destroking of said pump.

4,648,804

ASPIRATOR PUMP DEVICE FOR USE IN SEMICONDUCTOR PROCESSING

Mark Jones, and George Letrich, both of Mesa, Ariz., assignors to Intel Corporation, Santa Clara, Calif.

Filed Sep. 27, 1985, Ser. No. 781,234
Int. Cl.[4] F04B *23/14*; C23C *14/00*
U.S. Cl. 417—87 **5 Claims**

1. In the processing of semiconductor wafers, a device for evacuating a volume of corrosive gas contained in a processing enclosure, said device comprising:

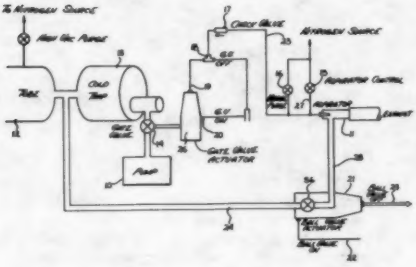
an aspirator coupled to said enclosure and to a motive gas source, said aspirator for evacuating said enclosure to a

first pressure, said aspirator having a motive fluid inlet, a nozzle, an entrained fluid inlet and an outlet;

a first valve means coupled to said motive gas source for controlling the operation of said aspirator;

a vacuum pump coupled to said enclosure for evacuating said enclosure to a second pressure, said second pressure less than said first pressure;

a second valve means coupled to said enclosure and said vacuum pump for isolating said vacuum pump during operation of said aspirator;



a third valve means coupled to said aspirator and said enclosure for isolating said aspirator during operation of said vacuum pump;

control means coupled to said valve for controlling the opening and closing of said valves;

whereby said vacuum pump is exposed to an amount of said corrosive gas less than said volume of corrosive gas, thereby extending the lifetime of said vacuum pump.

4,648,805

AIR COMPRESSOR WITH PRELOADED CLUTCH

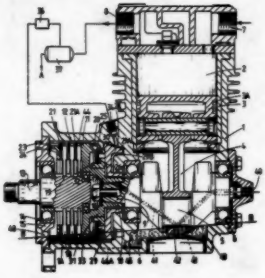
Paul Beaumont, Gwent, United Kingdom, assignor to Grau Girling Limited, Blackburn, England

Filed Mar. 25, 1985, Ser. No. 715,464

Claims priority, application United Kingdom, Mar. 30, 1984, 8408227; Jul. 26, 1984, 8419062

Int. Cl.[4] F04B *49/08*

U.S. Cl. 417—223 **8 Claims**



1. An air compressor comprising at least one compessor element operable by drive means to effect compression of air within a space, a clutch for transmitting drive from the drive means to the compressor element when compression is required, and a spring device operable normally to urge the clutch into engagement, the clutch and spring device being contained within a hollow clutch member which includes a retainer and means securing the retainer in a selected position determined by a desired pre-loading of the spring means so as to maintain the spring device permanently in the desired pre-loaded state.

4,648,806

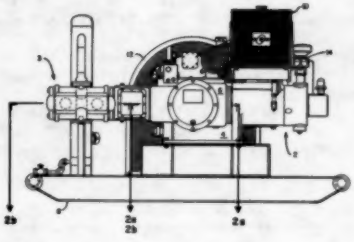
GAS COMPRESSOR

Jack L. Alexander, Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jun. 12, 1985, Ser. No. 743,850

Int. Cl.[4] F04B *9/04*; F16C *3/06*

U.S. Cl. 417—238 **4 Claims**



1. A compressor-prime mover unit for compressing a stream of gas comprising:

a. a prime move including a crank case and a rotatable power shaft protruding in a first direction from said crank case;

b. a compressor crank case secured to said crank case of said prime mover so as to enclose said protruding power shaft;

c. a substantially planar crank plate secured to said power shaft of said prime mover for rotation therewith, said crank plate including a plurality of securing sites formed therein in spaced relation one to another, each of said plurality of securing sites including a threaded hole formed in said crank plate and a counter bore formed in said crank plate in surrounding relation to said threaded hole, each of said plurality of securing sites being located at a different displacement with respect to the axis of rotation of said power shaft of said prime mover;

d. a crank pin selectively positioned in one of said plurality of securing sites so as to extend axially of said crank plate and in parallel relation to the axis of rotation of said power shaft of said prime mover, said crank pin including a threaded portion capable of being threadedly engaged in said threaded hole of any of said plurality of securing sites for purposes of selectively positioning said crank pin in one of said plurality of securing sites and a shoulder formed in juxtaposed relation to said threaded portion of said crank pin so as to be operative when said threaded portion of said crank pin is threadedly engaged in said threaded hole of one of said plurality of securing sites to transfer to said crank plate any lateral thrust imparted to said crank pin;

e. an elongated crank rod having one end thereof operatively connected to said crank pin so that said crank rod is made to move linearly in a second direction when rotation is imparted to said power shaft of said prime mover;

f. a guide tube secured to said compressor crank case so as to lie in a plane extending substantially perpendicular to the axis of rotation of said power shaft of said prime mover;

g. a crosshead connector mounted within said guide tube so as to be slidable longitudinally therewithin, said crosshead connector being operatively connected to the other end of said elongated crank rod so as to be caused to slide longitudinally within said guide tube when said elongated crank rod moves linearly in said second direction;

h. a compression cylinder secured to said guide tube so as to be coaxially aligned therewith;

i. a compressor piston mounted within said compression cylinder so as to be slidable longitudinally therewithin; and

j. means operatively connecting said compressor piston to said crosshead connector so as to cause said compressor piston to slide longitudinally within said compression cylinder when said crosshead connector is made to slide longitudinally within said compression cylinder when said crosshead connector is made to slide longitudinally within said guide tube while at the same time maintaining a fixed linear displacement between said compressor piston and said crosshead connector.

4,648,807

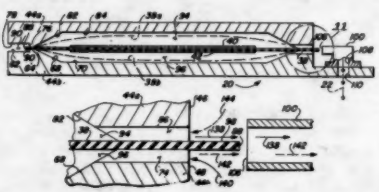
COMPACT PIEZOELECTRIC FLUIDIC AIR SUPPLY PUMP

Thomas B. Tippetts, Mesa, and Michael F. Cycon, Jr., Tempe, both of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed May 14, 1987, Ser. No. 734,003

Int. Cl.[4] F04B *35/04, 45/04*

U.S. Cl. 417—322 **30 Claims**



1. A piezoelectric fluidic air supply pump comprising:

(a) first and second generally disc-shaped housing members each having:

(1) an axially projecting portion having a depression formed in a central portion of the distal end thereof,

(2) a peripheral edge having a flattened portion, and

(3) a channel extending from said depression to open outwardly in an outlet on said flattened peripheral edge portion,

(b) a generally disc-shaped diaphragm member; and

(c) a duality of piezoelectric elements secured to opposite side surface portions of said diaphragm member and being electrically drivable to cause lateral vibration of said diaphragm member,

a peripheral portion of said diaphragm member being clamped between said axially projecting portions of said first and second housing members and extending across said depressions and channels thereof, said channels being in congruent alignment with one another, an unclamped portion of said diaphragm extending outwardly to separate said channels throughout their length from said depressions at least to said outlets, an annular peripheral portion of said diaphragm member being unrestrained.

4,648,808

SEALING SHROUD CENTRIFUGAL PUMP

Ernst Hauenstein, Vordemwald, Switzerland, assignor to CP Pumpen AG, Zofingen, Switzerland

Filed Jul. 9, 1985, Ser. No. 753,142

Claims priority, application Switzerland, Jul. 16, 1984, 3450/84

Int. Cl.[4] F04B *39/04, 17/00;* F04D *29/06*

U.S. Cl. 417—353 **11 Claims**

1. A centrifugal pump for pumping a medium comprising:

a pump housing having a drive side;

a sealing shroud arranged within said pump housing and sealing the drive side of said pump housing against the action of the pumped medium;

said sealing shroud containing a sealing shroud base and sealing shroud wall protruding from said sealing shroud base;

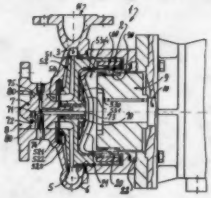
an inner rotor equipped with permanent magnets;

an outer rotor equipped with permanent magnets and arranged in spaced relationship from said inner rotor;

said sealing shroud wall extending between said inner rotor and said outer rotor;

a pump impeller connected with said outer rotor;

a drive motor connected with the inner rotor;



said inner rotor connected with said drive motor being arranged within said sealing shroud;

said outer rotor connected with said pump impeller being arranged externally of said sealing shroud; and

at least said sealing shroud wall being formed of electrically non-conductive material.

4,648,809

DEVICE FOR CONVEYANCE OF A PRESSURE MEDIUM, ESPECIALLY OIL

Karl Gensberger, Ingbert, Fed. Rep. of Germany, assignor to Flutec Fluidtechnische Gerate GmbH, Sulzbach, Fed. Rep. of Germany

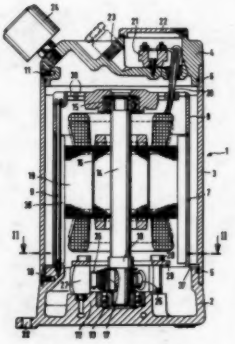
PCT No. PCT/DE84/00081, § 371 Date Nov. 9, 1984, § 102(e) Date Nov. 9, 1984, PCT Pub. No. WO84/04135, PCT Pub. Date Oct. 25, 1984

PCT Filed Apr. 6, 1984, Ser. No. 678,558

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1983, 3312828

Int. Cl.[4] F04B *17/00, 35/00, 39/02, 39/06*

U.S. Cl. 417—366 **13 Claims**



1. A device for conveying a pressure medium, especially oil, comprising:

an electric motor having a perpendicular shaft with opposite ends and having a stator, said motor including a drive rotor mounted on said shaft between said ends;

a pump coupled to and driven by said shaft, and having inlet and outlet means, said pump including a pump rotor between said opposite ends of said shaft;

a thick walled pump housing surrounding said pump;

a motor housing positioned concentrically with said pump

housing, said pump housing having a larger diameter than said motor housing such that respective wall ends of said housings are transversely spaced defining a clearance therebetween, said motor housing and said pump housing being fixedly coupled adjacent said wall ends, said motor housing having pairs of longitudinal fins extending axially along and radially inwardly from said motor housing and supporting said rotor;

a motor cover fixedly coupled to said motor housing;

first and second bearings supporting said opposite shaft ends and mounted in said pump housing and said motor housing; respectively;

tie rods located interiorly of said motor housing with each of said tie rods located between a respective pair of said fins, said tie rods connecting said motor cover and said motor housing to said pump housing and preventing relative rotation and movement therebetween;

a housing casing surrounding said motor housing and defining a clearance therebetween, said housing casing being fixedly connected to and sealed to said pump housing;

a housing cover spaced from said motor cover and coupled to and sealed to said housing casing; and

said clearances between said housing casing and said motor housing and between said motor housing and said pump housing permitting fluid to flow directly between interior spaces thereof.

4,648,810

CONTROL APPARATUS FOR A POSITIVE DISPLACEMENT RECIPROCATING PUMP

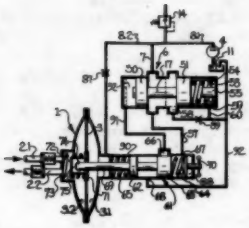
Heinz Schippers, Remscheid, and Siegfried Hertell, Radevormwald, both of Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Division of Ser. No. 434,172, Oct. 13, 1982, Pat. No. 4,523,901. This application May 14, 1985, Ser. No. 734,025

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1981, 3141359; Nov. 28, 1981, 3147235; Apr. 1, 1982, 3212112

Int. Cl.[4] F04B *43/06, 45/00;* F01L *75/02;* F16J *1/10*

U.S. Cl. 417—383 **7 Claims**



1. A positive displacement reciprocating pump for conveying a liquid or gaseous fluid, and comprising

a fluid enclosure,

movable piston means sealably disposed in said enclosure and dividing the enclosure into a pumping chamber on one side of the piston means and an actuating chamber on the other side thereof, and including spring biasing means for biasing said piston means toward said actuating chamber,

an inlet valve and a separate outlet valve each communicating with said pumping chamber,

control means for intermittently supplying a pressurized working fluid to said actuating chamber so as to intermittently move said piston means in a direction toward said pumping chamber and thereby discharge the conveyed fluid from such chamber, said control means including a source of pressurized working fluid, a working fluid line extending between said source and said actuating chamber, valve means operatively connected to said working fluid line and including a slide which is movable between an open position wherein said line is opened to a discharge tank means to release the pressure therein, and a closed position wherein the pressure of said working fluid is maintained in said line and delivered to said actuating chamber, and pre-control means controlled by the position of said piston means for effecting movement of said slide to said open position upon said piston means essentially reaching its maximum movement toward said pumping chamber, and for moving said slide to said closed position upon said piston means essentially reaching its maximum movement in the opposite direction, said pre-control means including spring means for biasing said slide of said valve means toward its closed position, and pre-control valve means for periodically biasing said slide toward its open position, said pre-control valve means including a valve housing extending along a direction aligned with the direction of movement of said piston means, a rod having a control collar fixed thereto slideably mounted in said valve housing, and means operatively interconnecting said piston means and said rod and including lost motion interconnection means whereby said rod is moved by said piston means only adjacent the ends of the opposite movements of said piston means.

4,648,811

CLOSED TYPE COMPRESSOR

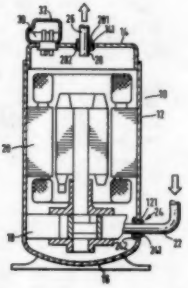
Masahiro Tahata, Fuji, and Hirokazu Washizu, Shizuoka, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

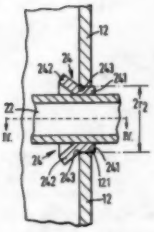
Filed Sep. 17, 1985, Ser. No. 776,796

Claims priority, application Japan, Sep. 27, 1984, 59-202743

Int. Cl.[4] F04B *39/12*

U.S. Cl. 417—410 **4 Claims**





1. A closed type compressor comprising:

(a) a casing having a cylindrical side wall which has a top and bottom ends, a top end wall, and a bottom end wall, said cylindrical side wall having an elliptical aperture

therein defined by an elliptical aperture wall, said elliptical aperture being elliptical in flat projection, and said top and bottom end walls closing the top end and bottom end of said cylindrical side wall, respectively;

(b) a compressor unit provided in said casing;

(c) an electric motor for driving said compressor unit, said electric motor being provided in said casing together with said compressor unit;

(d) a pipe joint mounted in said elliptical aperture in said cylindrical side wall, said pipe joint having a conical outer surface with a predetermined conical angle, the dimensions of said elliptical aperture being calculated so that said conical outer surface of said pipe joint meets said elliptical aperture wall without any gap between said conical outer surface and said elliptical aperture wall, whereby said cylindrical side wall and said pipe joint can be joined together by resistance welding; and

(e) a pipe for inducing or discharging gas to or from said compressor, said pipe being coupled to said pipe joint.

4,648,812

METHOD AND APPARATUS FOR PREVENTING PULSATIONS

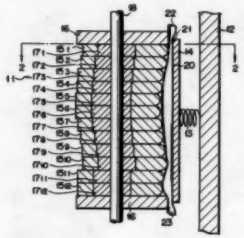
Susumu Kobayashi, Fujinomiya, and Hideyuki Morikawa, Tokyo, both of Japan, assignors to Terumo Corporation, Tokyo, Japan

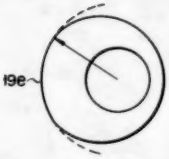
Continuation of Ser. No. 597,220, Apr. 5, 1984, abandoned, which is a continuation of Ser. No. 491,786, May 9, 1983, abandoned, which is a continuation of Ser. No. 231,952, Feb. 6, 1981, abandoned. This application Aug. 5, 1985, Ser. No. 763,077

Claims priority, application Japan, Feb. 12, 1980, 55-15645

Int. Cl.⁴ F04B *43/08*

U.S. Cl. 417—477 **16 Claims**





1. A peristaltic fluid-infusion finger pump apparatus comprising:

a peristaltic fluid-infusion finger pump which includes a plurality of fluid-infusion finger members arranged in an array of first to last stage fluid-infusion members each having a respective cam hole, cam means including a rotatable cam shaft and a plurality of eccentric cams mounted on said cam shaft for rotation with said cam shaft and stacked on said cam shaft to form a stacked cam block, said cam shaft being rotatable about a longitudinal rotation axis thereof, said eccentric cams being arranged as first to last stage eccentric cams respectively received in said cam holes of said fluid-infusion finger members, said eccentric cams being shifted from each other on said cam shaft through a predetermined angle;

each of said eccentric cams driving a respective fluid-infusion member through a given stroke, each of said eccentric cams having at a maximum stroke section thereof an arc-shaped cam surface portion having a curvature the radius of which is equal to that of a right circle formed with a rotation axis of said cam shaft as a center, and an outer circular contour line formed by the curvature of the stacked cam block being equal to the right circle at an upper end view;

a pressure plate facing said array of said first to last stage fluid-infusion finger members with an elastic tube clamped therebetween;

driving means coupled to said cam shaft to rotate said cam shaft together with said eccentric cams, whereby said fluid-infusion finger members are successively moved through a given stroke to apply a peristaltic movement to said elastic tube when said eccentric cams are rotated together with said cam shaft to infuse fluid through said elastic tube, said infused fluid having small fluid-infusion pulsations; and

pulsation correction means disposed at an outlet side of said peristaltic fluid-infusion finger pump, said pulsation correction means including:

at least one pulsation correction finger member having a cam hole therein; and

at least one further eccentric cam received in said cam hole of said at least one pulsation correction finger member, said at least one further eccentric cam being mounted on said cam shaft and being rotatably driven by said cam shaft;

said at least one pulsation correction finger member being moved by said at least one further eccentric cam and being coupled to said elastic tube for applying a pulsation waveform opposite to the waveform of fluid-infusion pulsations occurring on the outlet side of said peristaltic pump to said elastic tube to substantially cancel out said fluid-infusion pulsations.

4,648,813

UNIVERSALLY-MOVABLE MACHINE PART AND FLUID TRANSFER APPARATUS UTILIZING SAME

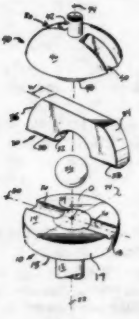
Willy E. Mikulan, Res. Concord III, Apt. 52, Calle Las Margaritas, Urb. Las Flores, Santa Teresa Del Tuy, Edo.Miranda, Venezuela

Filed Apr. 30, 1985, Ser. No. 728,921

Claims priority, application Venezuela, Apr. 30, 1984, 000685

Int. Cl.⁴ F01C *0/63*

U.S. Cl. 418—49 **18 Claims**



1. A universally-movable machine part comprising:

a disc member including a disc shaft establishing a first rotational axis, said disc member also including means

defining a recessed slot having a first bearing surface conforming to a smooth cylindrically-curved plane, said curved plane establishing a first center axis perpendicular to said first rotational axis and intersecting said first rotational axis at a center point;

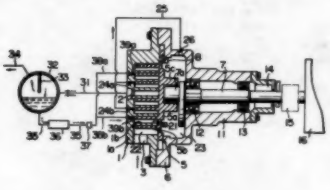
at least one planar vane member having upper and lower end portions, said lower end portion having a second bearing surface conforming to said smooth cylindrically-curved plane of said first bearing surface and pivotally slidably mated therewith so that said at least one planar vane member is pivotal between right and left lateral positions about said first center axis; and

a rotor member including a rotor shaft which establishes a second rotational axis intersecting said first rotational and said first center axes at said center point, said rotor member also including (i) means defining a groove which establishes a plane passing through said center point and in which said upper portion of said at least one vane member is accepted for permitting said rotor shaft to be pivotally movable within said established plane between forward and rearward positions about a second center axis intersecting said center point and being mutually perpendicular to both said first rotational and said first center axes, (ii) a convex upper spherical surface from which said rotor shaft upwardly extends, and (iii) means defining a lower surface which extends continuously away from said groove means and is as well upwardly and outwardly divergent relative to said center point for permitting said rotor member to be pivotally movable together with said at least one vane member about said first center axis between right and left lateral positions, wherein said disc shaft and said rotor shaft are universally movable relative to one another and wherein rotational movement of one of said disc and rotor shafts in a predetermined rotational direction is responsively transferred to the other of said disc and rotor shafts.

4,648,814
SCROLL FLUID MACHINE WITH OIL INJECTION PART AND OIL RELIEVING PASSAGE

Masao Shibayashi, Shimizu, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 8, 1985, Ser. No. 731,913
Claims priority, application Japan, May 25, 1984, 59-104514
Int. Cl.[4] F04C *18/04, 29/02*
U.S. Cl. 418—55 **1 Claim**



1. A scroll fluid machine having a stationary scroll member and an orbiting scroll member each having an end plate and a substantially spiral wrap extending from a plane of said end plate, said end plate of said stationary scroll member having a suction port and a discharge port respectively formed in a peripheral and a central portion thereof, said stationary and orbiting scroll members being assembled together with their wraps meshing with each other so as to form enclosed spaces between said wraps, means for enabling said orbiting scroll member to effect an orbital movement with respect to said stationary scroll member without rotating about its own axis whereby the volumes of said enclosed spaces are progressively decreased and a gas is drawn in from said suction port and progressively compressed in said enclosed spaces until the gas is discharged through said discharge port, wherein the improvement comprises: at least one oil injection port formed in said stationary scroll member, and at least one oil relieving passage defined between both scroll members, said oil injection port opening into at least one of said enclosed spaces, a wrap space defined between both scroll members and in a course of forming said one of said enclosed spaces serving for said oil relieving passage for providing an intermittent communication between a suction chamber and said oil injection port, and wherein said oil injection port is positioned in accordance with the following relationship:

$$\lambda e - 2\pi < \lambda oin < \lambda e - 2\pi + \pi/4,$$

wherein:

λoin: position of oil injection port in terms of scroll wrap angle (rad)

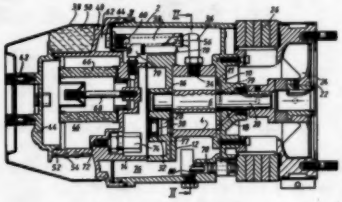
λe: position of wrapping terminal end of scroll wrap angle (rad)

π: circumference of circle to diameter ratio.

4,648,815
ROTARY AIR COMPRESSOR WITH THERMALLY RESPONSIVE OIL INJECTION

Michael R. Williams, West Midlands, England, assignor to The Hydrovane Compressor Company Limited, Redditch, England

Filed Sep. 5, 1985, Ser. No. 772,886
Claims priority, application United Kingdom, Sep. 5, 1984, 8422422
Int. Cl.[4] F04C *29/02;* **F01M** *5/00;* **B01D** *50/00*
U.S. Cl. 418—84 **4 Claims**



1. A rotary air compressor of oil sealed type including a stator, a rotor within said stator, oil injection means arranged, in use, to inject oil into the interior of said stator, an oil sump, a first oil pathway, connecting said sump to said oil injection means, an oil cooler situated in said first oil pathway and a thermally responsive valve situated in said first oil pathway, said thermally responsive valve being arranged to open only when the temperature of said oil has reached a predetermined value, whereby, in use, no oil is injected through said oil injection means before the temperature of said oil has reached said predetermined value, said compressor including an outer casing which accommodates said stator and defines said sump and which includes primary and secondary oil separation means for removing, in use, substantially all the entrained oil from the compressed air, said primary separation means including one or more surfaces against which said compressed air leaving said stator is constrained to impinge whereby a proportion of said entrained oil is caused to coalesce and then drip downwardly towards said sump, said secondary separation means including at least one coalescing element through which said compressed air is constrained to pass whereby substantially the remainder of said entrained oil is caused to coalesce, said compressor further including a secondary separation housing which accommodates said at least one coalescing element and is arranged below at least a part of said primary separation means and is so situated that at least a proportion of said oil coalesced by said primary separation means runs down over the outer surface of said secondary separation housing, said primary separation means including an annular primary separation chamber extending around said secondary separation

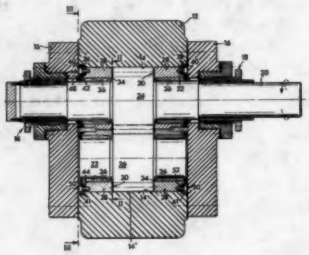
housing; said compressor further including an annular baffle plate extending around but not connected to said secondary separation housing, said annular baffle plate partially defining said primary separation chamber.

4,648,816

GEAR PUMP WITH RETAINING RINGS FOR THE END BUSHES

Martin Sauter, Zürich, Switzerland, assignor to Maag Gear-Wheel & Machine Company Limited, Zürich, Switzerland

Filed Feb. 28, 1983, Ser. No. 470,379
Int. Cl.[4] F04C *2/18, 15/00*
U.S. Cl. 418—134 **5 Claims**



1. A gear wheel machine, especially a gear pump for pumping polymer solutions or melts, said gear wheel machine comprising:

a housing;

a gear wheel space formed in said housing;

at least two shafts extending substantially in parallel to one another and extending through said gear wheel space;

a gear wheel provided for each one of said at least two shafts and arranged in said gear wheel space;

end bushes inserted into said housing;

each of said end bushes including an inner axial end and an inner end face;

said end bushes laterally bounding said gear wheel space;

said inner end faces of the end bushes forming axial bearings for the gear wheels;

bearing bushes each inserted into a respective one of said end bushes;

each of said bearing bushes forming a radial bearing for a respective one of said at least two shafts and having an inner end;

a collar formed at said inner axial end of each one of said end bushes;

said collar engaging over said inner end of an associated one of said bearing bushes;

cover members provided for said housing;

each of said cover members being laterally secured to said housing and supporting said end bushes including said bearing bushes against an outwardly directed axial displacement;

retaining rings arranged intermediate each said cover member and an adjacent one of said end bushes;

each retaining ring being supported at said housing against an inwardly directed axial displacement independently of said cover member; and

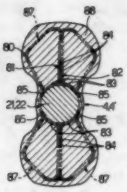
said end bushes being mounted essentially in an axially non-displaceable manner on said retaining rings.

4,648,817

SUPERCHARGER FOR SUPPLYING A HEAT ENGINE OF A MOTOR VEHICLE

Lauro Mariani, Leghorn, Italy, assignor to Gilardini S.p.A., Turin, Italy

Filed Apr. 12, 1985, Ser. No. 722,504
Claims priority, application Italy, Apr. 16, 1984, 67383 A/84
Int. Cl.[4] F01C *1/24, 21/06;* **B23P** *15/10*
U.S. Cl. 418—152 **13 Claims**



1. A supply supercharger for an engine of a motor vehicle, comprising:

an elongated main body having an axis and a portion defining a working chamber therein;

at least two rotating bodies disposed in said working chamber which are continuously sealed along at least a generatrix parallel to said axis;

at least one intake duct and at least one outlet duct in communication with said chamber; and

two opposing end caps axially delimiting said chamber;

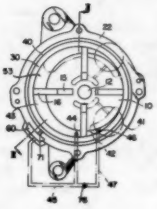
wherein at least one of said end caps and said rotating bodies comprises a skeleton and a molded material disposed about said skeleton.

4,648,818

ROTARY SLEEVE BEARING APPARATUS FOR A ROTARY COMPRESSOR

Hiroshi Sakamaki, Utsunomiya; Susumu Sugishita, Hanyu; Yukio Horikoshi, Kazo, and Kikuji Yanagihashi, Yono, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 616,812, Jun. 4, 1984, abandoned. This application Sep. 20, 1985, Ser. No. 777,877
Claims priority, application Japan, Jun. 9, 1983, 58-101714
The portion of the term of this patent subsequent to Apr. 30, 2002, has been disclaimed.
Int. Cl.[4] F04C *18/348*
U.S. Cl. 418—173 **9 Claims**



1. A rotary-sleeve bearing apparatus for a rotary compressor provided with a center housing, a rotary sleeve rotatably mounted in said center housing, a rotor disposed within said rotary sleeve, a plurality of vanes movably fitted in said rotor, and a discharge chamber, said apparatus comprising an air-bearing room disposed between said center housing and said rotary sleeve, an inlet disposed in the inner surface of said center housing toward which said rotary sleeve would be pushed from within by compressed air, and an air-supply passage extending to said inlet from either or both of said dis-

charge chamber and a compression working space under maximum pressure, said air-supply passage being provided with an accumulator for absorbing pulsations in the air supplied from said discharge chamber and/or said compression working space, said inlet consisting of a plurality of openings aligned with a single axial line in the area of the compression side, inner periphery of said center housing to which said rotary sleeve is pushed from within by the compressed air in said working space.

4,648,819

VANE-TYPE ROTARY COMPRESSOR WITH ROTARY SLEEVE

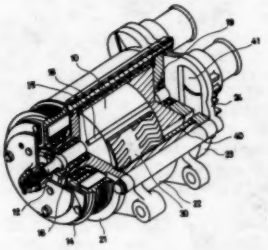
Hiroshi Sakamaki, Otsunomiya; Susumu Sugishita, Hanyu, and Yukio Horikoshi, Kazo, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 559,812, Dec. 9, 1983, abandoned. This application Mar. 26, 1986, Ser. No. 843,841

Claims priority, application Japan, Dec. 11, 1982, 57-216293

Int. Cl.[4] F04C *18/348*

U.S. Cl. 418—173 **6 Claims**



1. A rotary compressor provided with a center housing, a rotary sleeve mounted for rotation in said center housing, a rotor eccentrically disposed in said rotary sleeve, said rotor containing a plurality of vanes radially, movably fitted therein, and an air-bearing room defined between the outer periphery of said rotary sleeve and the inner periphery of said center housing, said rotary compressor comprising a multiplicity of air-accumulating grooves formed in both the inner periphery of said center housing and the outer periphery of said rotary sleeve, said grooves not overlapping with respect to one another.

4,648,820

APPARATUS FOR PRODUCING RAPIDLY QUENCHED METAL PARTICLES

David M. Scruggs, San Juan Capistrano, and Eric N. Mickelson, Mission Viejo, both of Calif., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 14, 1985, Ser. No. 797,925

Int. Cl.[4] B22F *9/10*

U.S. Cl. 425—8 **13 Claims**

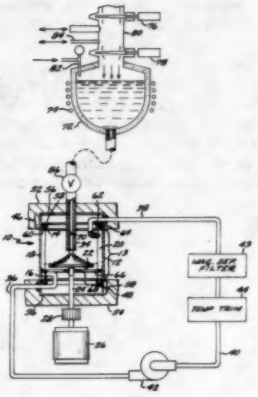
1. Apparatus for preparing metal particles from a molten source metal by quenching into a quench liquid, comprising:

a housing having a cylindrical hollow internal quench chamber, said quench chamber having an inwardly directed flange at each end thereof to define a liquid retention volume for holding a quench liquid, said quench chamber being rotatable about its cylindrical axis;

a spinner disk within said housing having an upper surface and a generaly conical protruding portion forming at least a part of the upper surface, said spinner disk being rotatable on the same axis as said quench chamber;

a source metal supply tube positioned to deposit molten source metal substantially in the center of the upper surface of said disk, whereupon the molten source metal is thrown outwardly into the quench liquid;

means for supplying the quench liquid to said liquid retention volume of said housing at one end thereof; and



means for continuously removing quench liquid and solidified particles mixed with said quench liquid from the other end of the liquid retention volume.

4,648,821

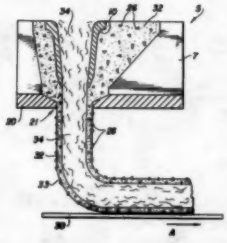
APPARATUS FOR CO-EXTRUSION OF A DOUGH MASS HAVING DISSIMILAR INNER AND OUTER PORTIONS

Robert Thulin, Wyckoff Rt., N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Aug. 31, 1984, Ser. No. 646,683

Int. Cl.[4] A21C *11/16*

U.S. Cl. 425—133.1 **13 Claims**



1. In a co-extrusion apparatus for forming a continuous food product having dissimilar inner and outer portions wherein said inner portion is enveloped by said outer portion and said outer portion is a dough, said apparatus comprising an inner extrusion port, an outer extrusion port, first conduit means, second conduit means and transport means, said inner extrusion port having an inner exit orifice with a first cross-sectional area through which said inner portion is extruded, said outer extrusion port having an outer exit orifice with a second cross-sectional area greater in area than said first cross-sectional area, said inner extrusion port being located entirely within said outer extrusion port and spaced from said outer extrusion port to define an exit passage between said inner extrusion port and said outer extrusion port, said first conduit means communicating with said inner extrusion port for providing said inner portion, said second conduit means communicating with said outer exit passage for providing said outer portion, whereby said outer dough portion passes through said exit passage and

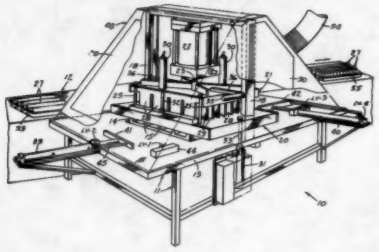
envelops said inner portion extruded through said inner extrusion port, said transport means including a continuously moving conveyor for receiving said food product upon extrusion through said inner and said outer extrusion port, the motion of said conveyor past said inner extrusion port and said outer extrusion port defining an upstream side and a downstream side with respect to said inner extrusion port and said outer extrusion port, the improvement wherein the inner extrusion port and the outer extrusion port are oriented to extrude the continuous food product substantially perpendicularly to the plane of the transport means; and the outer exit orifice has a cross-section with a first portion defining a straight base line at the upstream side and a second portion defining a curve at the downstream side, whereby the food product is provided with a cross-section facilitating the position of the food product on the conveyor.

4,648,822

APPARATUS FOR AUTOMATICALLY SUBDIVIDING DOUGH IN A SINGLE USE, NONMETALLIC TRAY

David Vandervoort, Orange, and Monty Griffith, Fullerton, both of Calif., assignors to Bridgford Foods Corporation, Anaheim, Calif.

Filed Jun. 10, 1985, Ser. No. 742,746
Int. Cl.[4] B29C *47/92*
U.S. Cl. 425—135 **29 Claims**



1. Apparatus for subdividing a loaf of dough supported in a disposable tray comprising:

a platen for supporting a disposable tray containing at least one loaf of dough to be subdivided;

a dough subdividing assembly overlying said platen including a vertically reciprocable dough stripper comprising plate means provided with vertical slots extending transversely of a loaf of dough to be subdivided, and vertically reciprocable dough subdividing blades having a close sliding fit with a respective one of said slots, said stripper being operable to strip dough from said blades during the retraction of said blades from subdivided dough; and

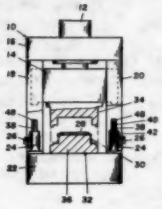
pneumatically powered automatic operating means for said dough subdividing assembly including control means therefor operable automatically when a tray of dough is positioned therebeneath on said platen to move said dough stripper substantially into loaf-confining contact with said tray adjacent the perimeter of said loaf followed by the extension and retraction of said dough subdividing blades to divide said loaf into a plurality of parts and for thereafter retracting said dough stripper away from said tray.

4,648,823

PRESS EQUIPMENT WITH SUPPORTING AND LEVELLING APPARATUS FOR PRODUCING MOLDING COMPOUND PARTS BY COMPRESSION

Tsuneaki Yashima, Takasago, Japan, assignor to Kawasaki Yucoh Co., Ltd., Hyogo, Japan

Filed Mar. 6, 1985, Ser. No. 709,064
Claims priority, application Japan, Apr. 18, 1984, 59-79125
Int. Cl.[4] B30B *15/24*
U.S. Cl. 425—150 **9 Claims**



1. A molding apparatus for press molding materials into molded parts which comprises a platen slidably supported within a lateral frame,

an upper mold half attached to said platen,

a lower bed,

a lower mold half disposed on said lower bed,

levelling means supported by said lower bed on opposite sides of said lower mold half, said levelling means containing hollow supporting rods slidably disposed for laterally supporting and levelling said platen within said lateral frame, and

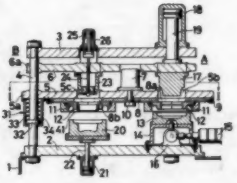
position detecting means mounted in said hollow supporting rods for detecting the height of the supporting rods, so that the levelling means can be synchronously controlled.

4,648,824

INJECTION STRETCHING BLOW MOLDING MACHINE

Katashi Aoki, 6037, Ohazaminamijo, Sakakimachi, Hanishina-gun, Nagano-ken, Japan

Filed May 15, 1985, Ser. No. 734,069
Claims priority, application Japan, May 18, 1984, 59-100164
Int. Cl.[4] B29C *49/06*
U.S. Cl. 425—150 **7 Claims**



1. An injection stretching blow molding machine comprising:

a base secured onto a machine bed,

a top plate positioned above said base and tie rods connecting said top plate to said base,

a movable plate with an undersurface and having an opening bore therein, said movable plate being slidably movable along said tie rods and disposed movably up and down between the base and the top plate;

a clamping plate positioned between the movable plate and the top plate, said clamping plate having a lower side and an opening bore therein,

a rotatable transfer plate located at the undersurface of said movable plate, a drive device for rotating the transfer

plate, at predetermined intervals, said drive device being above the movable plate, the transfer plate having an opening bore therein;

a number of hold molds consisting of split molds being mounted on an undersurface of said transfer plate, said hold molds being opened and closed in a radial direction;

an injection cavity and a blow cavity in the base, in closed connection with said hold molds;

an injection core and a blow core mounted at said lower side of said clamping plate and in closed connection with the hold molds from said openings bored in the movable plate and the transfer plate;

a stretching rod operating device and a releasing device provided above said clamping plate said stretching rod extending through said opening bore and said blow core of said clamping plate;

a clamping device provided above said top plate, said clamping device being movable into said injection cavity, the clamping device including a clamping rod, the clamping rod and the clamping plate being connected to end other; and

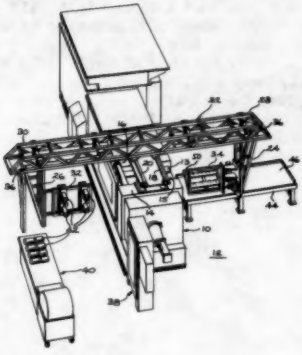
a returning device connected with the movable plate for moving the movable plate toward the top plate.

4,648,825

PLASTIC MOLDING APPARATUS

Robert F. Heil, and David S. Perry, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Mar. 14, 1986, Ser. No. 839,371
Int. Cl.[4] B29C *43/00, 45/00*
U.S. Cl. 425—186 **6 Claims**



1. Plastic molding apparatus comprising:

a horizontal molding press with two platens and a mold having an ejector mold half and a cover mold half that form a mold cavity, each mold half being secured to a platen with at least one platen movable horizontally relative to the other platen to open and closed positions, said molding press having longitudinal rails along the top thereof parallel to the direction of relative movement of the platens,

an elongated horizontal gantry structure supported solely by the press and movably secured to the rails, said gantry structure being oriented normal to the rails and movable along the rails,

two arms, one of which depends from one end of the gantry and the other depends from the opposite end of the gantry, said arms being movably secured to the gantry for back and forth movement along the longitudinal axis of the gantry,

a load carrier secured to one of the arms and an unload carrier secured to the other arm, each load and unload carrier being movable with said arms,

means to move the two arms toward each other when the mold is open to position the load carrier and unload carrier in the press simultaneously, and

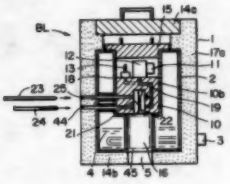
means to move the two arms away from each other and remove the load carrier and unload carrier from the press prior to closing the mold.

4,648,826

MELT-SPINNING APPARATUS

Masafumi Ogasawara, Otsu; Nobu Yamaguchi, Shiga, and Yoshikazu Morlki, Otsu, all of Japan, assignors to Toray Industries, Inc., Japan

Filed Mar. 11, 1985, Ser. No. 710,095
Int. Cl.[4] D01D *4/08*
U.S. Cl. 425—192 S **11 Claims**



1. A melt-spinning apparatus for producing synthetic fibers comprising:

(A) a heating box having a space surrounded by the heating box, said space being open to the atmosphere at the bottom of the heating box;

(B) a block surrounded by and supported by the heating box and the block having a cavity, the cavity having an opening into the space of the heating box at the bottom of the block;

(C) a melt-spinning pack having a head projection extending upward from a top of the melt-spinning pack and said melt spinning pack is inserted upward into the space of the heating box, the head projection being inserted upwardly into the opening of the cavity of the block and being detachably set to the block;

(D) a polymer melt outlet positioned in a first vertical wall defining a portion of the cavity of the block and the melt outlet is connected to a polymer melt-feeding source through a first conduit formed in the block;

(E) a polymer melt inlet positioned in a second vertical wall defining a portion of the head projection, the melt inlet in communication with a spinning orifice through a second conduit formed in the melt-spinning pack and faces the polymer melt outlet at the position at which the head projection of the melt-spinning pack is set to the block;

(F) a gasket positioned around the opening of the polymer melt inlet of the head projection of the melt-spinning pack;

(G) fixing means for detachably setting the head projection of the melt-spinning pack to the block, which comprises a shifting member inserted from the outside of the block opposite the polymer melt inlet toward the cavity of the block, the shifting member contacting the head projection, the insertion of the shifting member causing the head projection to move to a position at which the polymer melt inlet comes into contact with the polymer melt outlet through the gasket and to be set to the block;

(H) at least one first portion formed on at lest one vertical wall defining the cavity of the block;

(I) at least one second portion formed on at least one vertical wall defining the head projection of the melt-spinning pack the first and second portions being configured in a relationship to each other adequate to allow the gasket set up around the polymer melt inlet to be spaced from the first vertical wall of the block while the head projection is inserted upward into the cavity of the block up to a top

position thereof and the head projection being movable from a top position toward a position at which the polymer melt inlet of the head projection is connected to the polymer melt outlet through the gasket.

4,648,827

SCREW PLASTIFYING AND CONVEYING DEVICE OF AN INJECTION MOLDING MACHINE FOR PLASTICS

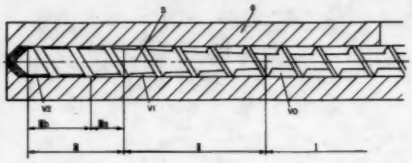
Friedrich Laimer, Reichenburg, and Hermann Neugebauer, Filzbach, both of Switzerland, assignors to Netsal-Maschinen AG, Switzerland

Filed Sep. 21, 1984, Ser. No. 653,877

Claims priority, application Switzerland, Sep. 30, 1983, 5324/83

Int. Cl.[4] B29C *45/03, 45/48, 45/50*

U.S. Cl. 425—208 **10 Claims**



1. A screw plastifying and conveying device of an injection molding machine for plastics, comprising a plastifying cylinder having a material inlet and a mold injection outlet spaced away from said inlet in a conveying direction, dosing means connected to said cylinder for supplying material to said inlet, a screw comprising a shank with a helical thread having a plurality of turns on said shank, each turn having a depth by which it extends from said shank, adjacent turns being separated by a web width on said shank, said screw mounted in said plastifying cylinder for rotation and for axial displacement therein, drive means connected to said screw for rotating and for axially displacing said screw, said screw thread defining a feed zone communicating with said inlet, a first compression zone and a second compression zone ending at and communicating directly with said outlet, said first compression zone being between said feed zone and said second compression zone, each of said first and second compression zones having a compression ratio which is a ratio between a pitch volume of the screw at the end and the beginning of each compression zone in the conveying direction, the compression ratio of the second compression zone being greater than the compression ratio of the first compression zone.

4,648,828

CRUDE MATERIAL FORMING MACHINE

Kazuo Abe, Fukuoka, and Akira Shimamura, Kokubunji, both of Japan, assignors to Nisshin-Dca Foods Inc., Tokyo, Japan

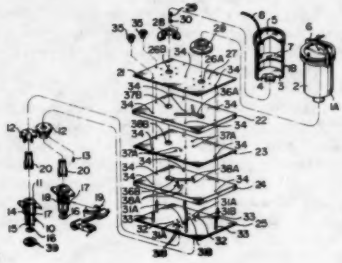
Filed Jul. 11, 1985, Ser. No. 753,898

Claims priority, application Japan, Jul. 19, 1984, 59-109126; Dec. 24, 1984, 59-272173

Int. Cl.[4] A21C *11/16*

U.S. Cl. 425—288 **1 Claim**

1. A machine for forming viscous fluid crude material such as dough or fish-paste into a ring shape or the like, comprising a cutter device including a nozzle guide cylinder having upper and lower openings, said cutter device comprising a disc centrally positioned below the lower opening and a cutter sleeve slidable on the guide cylinder, a guide passage between the upper and lower openings for guiding crude material introduced forcely through the upper opening so as to be extruded from the lower opening, and cutter means arranged at the lower opening for cutting off the extruded crude material thereat, said passage being partitioned at least in its upper portion into a plurality of annular sector-shaped sections by means of a separator, at least two crude material tanks, each provided with a lower end opening, and a distributor including a plurality of distributing passages, each of said distributing passages causing one of the lower end openings of the tanks to communicate with selected one or ones of the upper ends of the annular sector-shaped sections, the distributor comprising an upper plate having a plurality of openings opposed to the lower end openings of the tanks, a lower plate having a plurality of openings opposed to the upper ends of the sector-shaped sections, and a passage forming unit between the upper and lower plates, said unit having a plurality of holes, each of the openings in the upper plate being connected to selected one or ones of the openings in the lower plate through selected one or ones of the holes in the unit.



4,648,829

DEVICE FOR SHAPING ICE CREAMS AND FOOD ARTICLES OF CREAMY CONSISTENCY

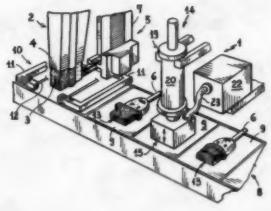
Luciano Cattani, Milan, Italy, assignor to Sauer, S.p.A., San Giuliano Milanese, Italy

Filed Jan. 28, 1985, Ser. No. 695,856

Claims priority, application Italy, Feb. 13, 1984, 19593 A/84; Feb. 13, 1984, 19594 A/84

Int. Cl.[4] A23P *1/00*; A23G *9/04*

U.S. Cl. 425—326.1 **3 Claims**



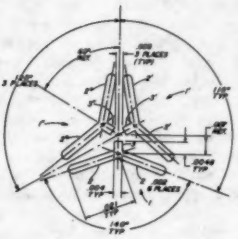
1. A device for shaping ice cream into shaped articles, comprising a combination with extruder members (2) to deliver an ice-cream blank (3), cutter members (10) to subdivide said blank (3) into a plurality of slugs (13), and means for transporting said slugs (13) while being carried by trays (9) to a molding device (1), said molding device (1) shaping said slugs of ice cream on said trays (9) and comprising operative members (22, 23) to supply compressed air, and at least one forming unit (15), said forming unit (15) including an air pervious contoured die (16) having an ice cream facing surface and an opposite surface and formed by a uniformly porous material with a substantially uniform thickness, drive elements (19) for moving said die (16) toward the slugs of ice cream to be shaped, and means defining an internal chamber (18) supplied by compressed air by said operative members (22, 23) and in communication with said opposite surface of said die (16) to realize a uniform distribution of compressed air and a thin gap of air between the total surface of said shaped article and the ice cream facing surface of said die (16).

4,648,830

SPINNERETTE FOR PRODUCING HOLLOW TRILOBAL CROSS-SECTION FILAMENT

Weldon H. Peterson, Colonial Heights, and Kenneth G. Morrison, Chester, both of Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 13, 1985, Ser. No. 733,300
Int. Cl.[4] D01D *5/24*
U.S. Cl. 425—464 **2 Claims**



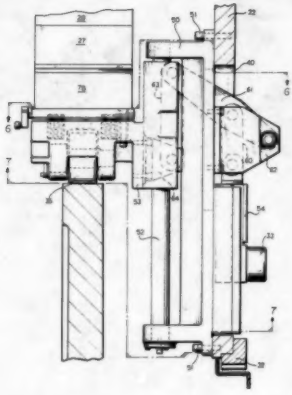
1. A spinnerette plate for the manufacture of trilobal fiber with a hole in each lobe, said spinnerette having at least one filament forming bore group having a center and said bore group having three openings, each of said openings being "Y" shaped with one short straight leg having an axis and the axis of each short leg converging on the center of the bore group, and said opening having two long straight legs each of the long legs of the same "Y" being divergent from each other by an angle of at least 130° to 150°.

4,648,831

BLOW MOLDING APPARATUS

Eric C. Johnson, Saline, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 28, 1984, Ser. No. 594,073
Int. Cl.[4] B29C *49/56*
U.S. Cl. 425—540 **12 Claims**



1. In a blow molding apparatus wherein a plurality of circumferentially spaced sets of molds are mounted on a wheel plate for rotation about a horizontal axis and plastic material is extruded in tubular form between the mold sections of each set of molds and the molds are closed and the portion of the plastic within each mold section is blown to form a hollow article, wherein each set of molds includes a movable mold section and a fixed mold section, wherein the improvement comprises a slide assembly for mounting the movable mold section of each set of molds, said slide assembly comprising:

a base, mounted on said wheel plate,

a slide on said base supporting said movable mold section and movable radially inwardly toward and radially outwardly away from said fixed mold section,

a cam follower slidable radially upon said base,

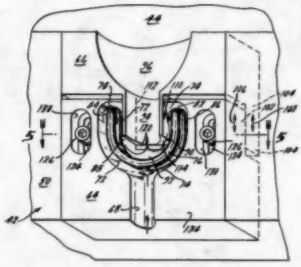
and linkage means between the cam follower and the slide operable to move the slide and, in turn, the movable mold section mounted thereon in a radial direction at a multiple of the radial movement of the cam follower to provide a rapid movement of the movable mold section radially inwardly and radially outwardly as the cam follower follows an arcuate cam on the apparatus.

4,648,832

MOLDED WINDOW GASKET ASSEMBLY AND APPARATUS AND METHOD FOR MAKING SAME

Albert F. Reilly, Howell, and John L. Sanok, Grosse Isle, both of Mich., assignors to Sheller Globe Corporation, Toledo, Ohio

Filed Jun. 17, 1983, Ser. No. 505,196
Int. Cl.[4] B29C *45/03*; B01F *13/00*
U.S. Cl. 425—543 **10 Claims**



1. A static mixer apparatus for a mold adapted for molding a flowable material, said static mixer apparatus comprising: a mixer block; and a mold gate member; said static mixer apparatus having an inlet passage defined by a surface of said mixer block, and a plurality of serpentine passages in communication with said inlet passage and at least in part defined by surfaces of said mixer block and said mold gate member; said mold gate member being movable relative to said mixer block in a generally axial direction with respect to said inlet passage in order to vary the flow areas of at least portions of said serpentine passages.

4,648,833

HOT NOZZLE FOR RUNNERLESS MOLD

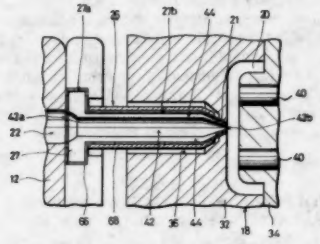
Fujio Yamada, 50, Toei 3-chome, Chiryu-shi, Aichi-ken, Japan

Filed Oct. 17, 1985, Ser. No. 788,742
Int. Cl.[4] B29C *45/03*; B29F *1/03*
U.S. Cl. 425—549 **6 Claims**

1. A hot nozzle for use with a mold for runnerless injection molding of plastic material, said mold including a fixed mold half and a movable mold half and having at least one mold cavity formed therewithin, said fixed mold half having at least one longitudinal bore communicating with said mold cavity, said hot nozzle comprising:

a body formed of a conductive metal having a predetermined electrical resistance, said body having a nozzle portion adapted for insertion into said longitudinal bore and a base portion communicating with said nozzle portion to provide for the flow of molten resin to said mold cavity, said body having a central passage for the plastic material, a pair of diametrically disposed longitudinal slits

therethrough extending substantially over the length thereof except at at least a portion of the forward end of said nozzle portion in such a manner as to divide said body substantially into two sections, said base portion having on opposite ends separated by said slits a pair of power re-



ceiving means electrically connected to an external source of power; and

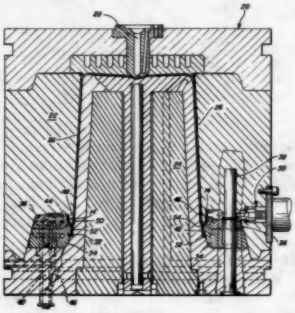
a dielectric and adiabatic film formed over the outer surface of said body in such a manner as to cover said slits of said body.

4,648,834

MOLD FOR MANUFACTURING FLANGED OBJECTS WITHOUT SIDE ACTION

John W. Von Holdt, 7430 North Croname Rd., Niles, Ill. 60648

Filed Jun. 7, 1985, Ser. No. 742,330
Int. Cl.[4] B29C *45/40, 45/44*
U.S. Cl. 425—556 **20 Claims**



1. In a plastic injection mold having an outer mold half and a mold core defining between them a mold cavity, said mold half and said mold core being movable between a closed, molding position and an open position to permit removal of objects molded herein said injection mold having a mold opening and closing direction, and sprue means for allowing filling of the mold cavity with molding compound while in the closed molding position, the improvement comprising, in combination:

said plastic injection mold defining as part of the mold cavity an annular chamber position for receiving molding compound to form an outwardly projecting, relatively thick, annular section in a molded object;

stripper means for pushing newly formed molded objects out of initmate contact with the mold core a diameter of a portion of said mold core across which said annular section is pushed by said stripper means being less than the diameter of the mold core portion against which said annular section is formed, whereby a freshly molded annular section can shrink inwardly upon cooling and be drawn out of said annular chamber portion for removal from the mold, said stripper means being generally movable parallel to said mold opening and closing direction.

13. In a plastic injection mold having an outer mold half and a mold core defining between them a mold cavity, said mold half and mold core being movable between a molding position and an open position to permit removal of objects molded therein and sprue means filling the mold cavity with molding compound while in the closed position, the improvement comprising, in combination:

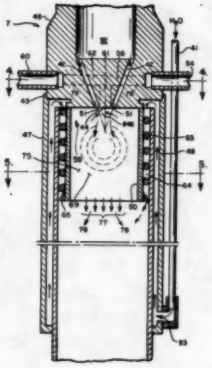
stripper means to facilitate moving of newly formed molded objects out of intimate contact with the mold core, said stripper means comprising a first stripper ring which defines an annular chamber portion for receiving molding compound to form an outwardly projecting relatively thick, annular section in the molded object, a second stripper ring defining one side of a second, outwardly projecting portion of the mold cavity, means for guiding the movement of said first and second stripper rings in a direction generally parallel to the movement of the mold core and mold cavity, and means for driving said second stripper ring to move newly formed molded objects out of intimate contact with the mold core by pushing the outwardly projecting members formed in molded objects by the second outwardly projecting portion of the mold cavity, said first stripper ring being freely slidable along its range of motion for a limited distance of less than the length of movement of said second stripper ring, to move with newly formed molded objects until their thick annular section disengages from said annular chamber portion.

4,648,835

STEAM GENERATOR HAVING A HIGH PRESSURE COMBUSTOR WITH CONTROLLED THERMAL AND MECHANICAL STRESSES AND UTILIZING PYROPHORIC IGNITION

Stephen Eisenhawer, Albuquerque; Anthony J. Mulac, Bernalillo County; A. Burl Donaldson, and Ronald L. Fox, both of Albuquerque, all of N. Mex., assignors to Enhanced Energy Systems, Albuquerque, N. Mex.

Continuation of Ser. No. 489,855, Apr. 29, 1983, abandoned. This application Jul. 8, 1985, Ser. No. 753,800
Int. Cl.[4] F23J *7/00*
U.S. Cl. 431—4 **8 Claims**



1. In a direct fired high pressure steam generator of the type having a burner base with means for supplying feedwater, gaseous fuel and oxidizer, and a feedwater cooled combustion chamber extending from said base along a common longitudinal axis, said base/chamber extension defining a chamber inlet end, said chamber generating high pressure combustion gases and having a section for generating steam by mixing feedwater and combustion gas, the improvement comprising;

a plurality of conduits in said base terminated by inlet ports defined by said inlet end, said conduits angularly disposed to said longitudinal axis of said base and chamber for directing gaseous oxidizer through said ports internal of said combustion chamber and in said base end for generating gaseous oxidizer jets, said jets intersecting entirely internal said chamber; and,

a central fuel inlet port in said base and centrally adjacent said oxidant inlet ports for generating a central fuel jet, said jet intersecting said oxidizer jets and means for introducing water into said fuel inlet port so as to reduce vibrations caused by combustion.

4,648,836

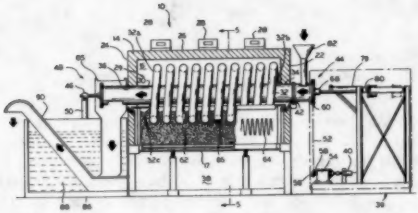
ROTARY RETORT FURNACE

Terrence C. Thom, St. Catharines, Canada, assignor to Can-Eng Holdings, Ltd., Canada

Filed Nov. 26, 1985, Ser. No. 801,834

Int. Cl.[4] F27B 7/08; F26B 11/04

U.S. Cl. 432—107 **12 Claims**



1. In a continuous rotary retort furnace, the improvements comprising, in combination:

a outer shell having first and second ends;

a retort assembly extending through openings in said first and second ends;

support means for supporting said retort assembly at both ends external of said shell;

said retort assembly being formed of an axial member and a spirally-wound conduit disposed on the exterior surface in said axial member;

drive means coupled to said support adjacent said first end for rotating of said retort assembly;

means for loading and unloading of parts to be heat treated into the spirally-wound conduit of said retort assembly; and

said means for loading and unloading including a charge/-discharge assembly housed within said axial member and being formed of a charge container and a discharge container connected to said charge container by a rod.

4,648,837

WALKING BEAM FURNACE

Augusto Funghini, Solingen; Dieter Schwab, and Helmut Springer, both of Düsseldorf, Fed. Rep. of Germany, assignors to Italimpianti S.p.A., Genova, Italy

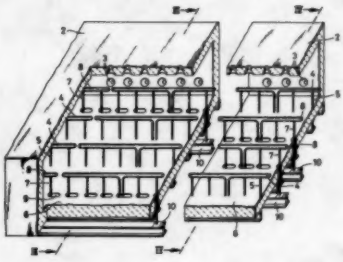
Filed Nov. 4, 1985, Ser. No. 794,758

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1984, 3440126

Int. Cl.[4] F27B 9/14

U.S. Cl. 432—122 **3 Claims**

1. A walking beam furnace comprising a hearth consisting of fixed beams and walking beams disposed with their longitudinal axes parallel to the feed direction through said furnace, the improvement wherein each of said walking beams and said fixed beams is subdivided into sections at positions spaced apart in said feed direction and each of said sections of each of said beams is disposed staggered relative to the adjacent section of said beam, and each of said rows consisting of fixed



beam sections disposed alternately with walking beam sections on a substantially common longitudinal axis.

4,648,838

DENTAL HANDPIECE

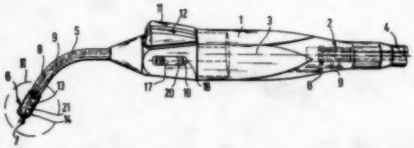
Siegfried Schlachter, Joinville S.C., Brazil, assignor to Kaltenbach & Voigt GmbH & Co., Fed. Rep. of Germany

Filed Jun. 25, 1985, Ser. No. 748,577

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1985, 3500085

Int. Cl.[4] A61C 3/00

U.S. Cl. 433—29 **22 Claims**



1. A dental handpiece with a bent canula arranged at its forward end, and at the forward end of which canula is located at least one discharge opening for the discharge of a flowing medium, characterized in that a light emitting element is arranged directly behind said discharge behind said discharge opening of the canula, which is formed by the free end of a light conductive fiber optic bundle, with the fiber optic bundle being positioned in front of a light source and extending therefrom to a position behind a front piece constructed of a transparent material, such that light from the light source is carried by the fiber optic bundle to the transparent front piece and is projected therethrough from the free end of the fiber optic bundle, and said at least one discharge opening being arranged in said transparent front piece, with at least one media passageway extending through the front piece to said at least one discharge opening.

4,648,839

CARRIER DEVICE FOR HAND TOOLS, FOR USE IN DENTAL WORK

Ake Timerdahl, Värmdö , and Jan Angseryd, Trangsund, both of Sweden, assignors to Landstingens Inkopscentral, Lic, Ekonomisk Forening, Solna, Sweden

Filed Aug. 22, 1985, Ser. No. 768,336

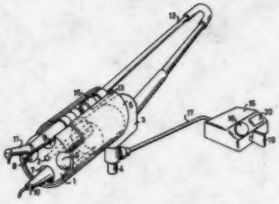
Claims priority, application Sweden, Aug. 31, 1984, 8404369

Int. Cl.[4] A61C 1/14

U.S. Cl. 433—77 **3 Claims**

1. A carrier device for selecting different hand tools for use in dental work, comprising holders for different tools, and supply means for supplying pressurized air and water to the tools, a magazine to carry the tools movable in a manner to

enable a selected tool to be moved to a pick-up station; the supply means located at said pick-up station comprising a single, flexible supply conduit incorporating channels for pres-



surized air and water; and the tools and the supply conduit having respective coupling means for connecting a selected tool to the supply conduit in the pick-up station.

4,648,840

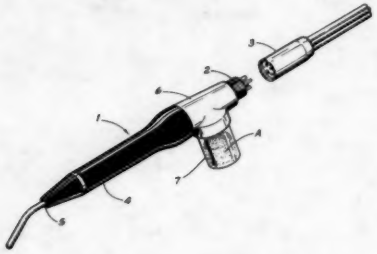
DENTAL POLISHER COMBINING PRESSURIZED FLUID AND ABRASIVE FLOW

Stephen W. Conger, Sr., 10544 Sonata Dr., St. Louis, Mo. 63123

Filed Aug. 15, 1985, Ser. No. 765,813

Int. Cl.[4] A61C *1/14*

U.S. Cl. 433—125 **11 Claims**



1. A dental polisher combining pressurized fluid and an abrasive flow for application to the teeth of a patient during performance of a cleaning function, said polisher capable of attaching with a standard supply fitting, comprising, a body means having a length to be conveniently grasped and held by the hand during application of the polisher, said body means having a pair of conduits therethrough, one conduit being a fluid conveying conduit, and the other being an abrasive conveying conduit, a delivery nozzle provided forwardly of the body means, connecting therewith, and useful during application for separately discharging the fluid and abrasive while providing for their convergence forwardly of the nozzle and into a combined flow, a supply housing means provided rearwardly of the body means and incorporating a pair of additional conduits for accommodating separate flows of the fluid and abrasive and each communicating with the respective conduits provided through the body means, a reservoir connecting with the housing means and provided for holding a supply of abrasive, the said abrasive conduit through the housing means formed into two flow lines, one of said flow lines at one end communicating with the interior of the reservoir, and at its other end opening for attaching with the supply fitting, the other flow line at one end also communicating with the interior of the reservoir and at its other end opening for communication with the abrasive conveying conduit provided through the body means, wherein air under pressure traversing said abrasive conduits entraining said reservoired abrasive for conduct through and discharge from the said delivery nozzle, said delivery nozzle having a series of discharge ports therethrough, one of said discharge ports being centrally disposed and communicating with the abrasive conveying conduits and provided for releasing a stream of the pressurized air entrained abrasive, and a series of additional fluid discharge ports surrounding said central port, and communicating with the fluid conveying conduits and providing for release of a series of streams of fluid substantially surrounding the discharged abrasive stream, and wherein said abrasive discharge port of the nozzle extending further forwardly than the fluid discharge ports of the same nozzle.

4,648,841

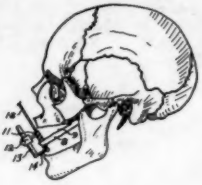
UPPER DENTURE ATTACHMENT MEANS

Kenneth J. Smith, 234 Medical Clr., Morehead, Ky. 40351

Filed Jan. 31, 1986, Ser. No. 824,673

Int. Cl.[4] A61C *8/00*

U.S. Cl. 433—173 **1 Claim**



1. A procedure for the permanent attachment of upper dentures to the maxilla of the human mouth including sliting the maxilla horizontally immediately above the nasal floor, with the maxilla in a down fractured position, including drilling at least one hole through the severed portion of the maxilla in a direction lateral to the slit, inserting a generally planar retaining device with cooperative fastener means located therein where the fastener means are located over the said to provide access from the bottom side of the maxilla, returning the maxilla to approximately its original position with the retaining device located in the slit and fastening the severed portion of the maxilla to the balance of the maxillato allow healing thereof with the retainer in place.

4,648,842

IMPLANT REPLACEMENT FOR A EXTRACTED TOOTH

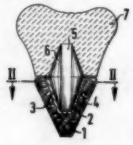
Hans Grundei, Lübeck, Fed. Rep. of Germany, assignor to S + G Implants GmbH, Lübeck, Fed. Rep. of Germany

Filed Sep. 13, 1985, Ser. No. 775,759

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1984, 3434309

Int. Cl.[4] A61C *13/00*

U.S. Cl. 433—175 **1 Claim**



1. An implant as a replacement for an extracted tooth, the implant comprising a molding implantable in a jaw bone, and having at one end an essentially conical recess with a flat surface formed by a solid metal wall, and having at its other end other end an open cell structure connected to said metal wall to permit bone tissue to grow thereinto following implantation, and a metal cone both ends of which are conical with a flat surface, and one end of which is inserted into said conical recess of said molding and the other end of which is engageable with a replacement tooth.

4,648,843

METHOD OF DENTAL TREATMENT USING POLY(ETHYLENICALLY UNSATURATED) CARBAMOYL ISOCYANURATES AND DENTAL MATERIALS MADE THEREWITH

Sumita B. Mitra, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 19, 1985, Ser. No. 757,124
Int. Cl.[4] C09K 3/00; A61L 8/00; A61K 5/01
U.S. Cl. 433—201.1 **16 Claims**

1. A method of dental treatment which comprises placing in temporary or permanent bonded or touching contact with a tooth a dental material comprising a polymerized or unpolymerized poly(ethylenically unsaturated) carbamoyl isocyanurate.

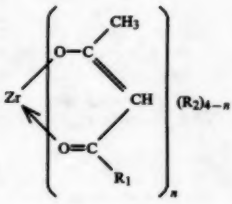
4,648,844

DENTAL LINING COMPOSITION

Ikuo Omura; Tatsuhiko Higaki, and Junichi Yamauchi, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Mar. 10, 1986, Ser. No. 837,965
Claims priority, application Japan, Mar. 22, 1985, 60-59140
Int. Cl.[4] A61K 5/07
U.S. Cl. 433—217.1 **5 Claims**

1. Two-pack type dental lining compositions comprising (a) a solution of a polymer having at least 10 mole % of a carboxyl-containing vinyl monomer, and (b) a solution of a zirconium chelate compound represented by the following general formula



(wherein R_1 denotes $—CH_3$, $—OCH_3$ or $—OCH_2CH_3$, R_2 stands for an alkoxy of 2 to 10 carbon atoms, and n is an integer from 2 to 4).

4,648,845

METHOD FOR REPAIRING OF VENEERED DENTAL CAST RESTORATION

Jan A. Orlowski, Altadena, and David V. Butler, West Covina, both of Calif., assignors to Scientific Pharmaceuticals, Inc., Duarte, Calif.

Filed Nov. 27, 1985, Ser. No. 802,326
Int. Cl.[4] A61C 5/00; A61K 6/08
U.S. Cl. 433—217.1 **21 Claims**

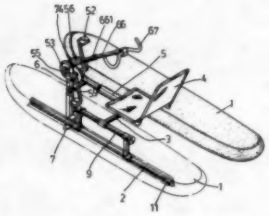
1. A method of repairing a damaged, worn or otherwise deficient veneer on dental prosthesis comprising application over the metal base in the area to be restored a polymerizable primer composition containing (a) (1) acrylic acid, methacrylic acid, polyacrylic acid, or polymethacrylic acid and (2) an ester of acrylic acid, an ester of methacrylic acid, a polymer of an ester of acrylic acid or a polymer of an ester of methacrylic acid, or (b) a copolymer of either acrylic acid or methacrylic acid with an ester of acrylic acid or an ester of methacrylic acid, or (c) a copolymer as in (b) together with an ester of acrylic acid or an ester of methacrylic acid.

4,648,846

PEDAL BOAT

Chen-Hsiung Hsu, 2 Fl., No. 20-3, Peiping E. Rd., Taipei, Taiwan

Filed May 29, 1985, Ser. No. 738,751
Int. Cl.[4] B63B 35/72
U.S. Cl. 440—31 **1 Claim**



1. A pedal boat comprising:
two inflatable members each having a supporting frame therein, said inflatable members being connected by a transverse rod;
a seat mounted on the middle of said transverse rod;
a transmission mechanism including
a tubular casing connected at the lower end with a housing,
a cylindrical member enclosing the lower part of said tubular casing,
a stud mounted on said tubular casing,
a bevel gear keyed to said stud,
a driven gear mounted on an outer side of said bevel gear and keyed to said stud,
a first side gear mounted in said tubular casing and engaged with an upper part of said bevel gear,
a second side gear mounted in said tubular casing and engaged with a lower part of said bevel gear,
a steering axle extending through said tubular casing,
a first hollow axle enclosing said steering axle and fastened to said first side gear, said first hollow axle extending downwardly and connected with a first pinion via a first single-way bearing,
a second hollow axle enclosing said first hollow axle and fastened to said second side gear, said second hollow axle extending downwardly and connected with a second pinion via a second single-way bearing;
a contractible rod extending from the middle of said transverse rod, the other end of said contractible rod being secured to said tubular casing of the transmission mechanism;
a steering member being attached to one end of a shaft which is supported by a bracket connected to the contractible rod, the other end of said shaft being connected to a top end of said steering axle with a universal joint;
a pair of pedals, each pivoting on a crank affixed to one end of a shaft which is supported by a supporting member secured to said contractible rod;
drive means connecting said crank to the driven gear; and,
a propeller disposed on a shaft secured within said housing, an inside end of the shaft being attached to a bevel gear which is driven by both said first pinion and said second pinion.

4,648,847

ADJUSTING MECHANISM FOR VARIABLE PITCH WATERCRAFT PROPELLERS

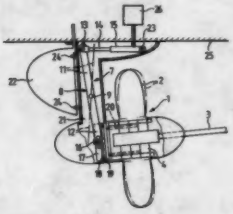
Peter Mueller, Widmerstrasse 27, Zürich, Switzerland

Filed Mar. 13, 1985, Ser. No. 711,161

Claims priority, application Switzerland, Mar. 16, 1984, 1354/84

Int. Cl.⁴ B63H *3/08*

U.S. Cl. 440—50 **3 Claims**



1. A watercraft including an adjusting mechanism for setting the pitch of propeller blades rotatably mounted on the hub of a variable pitch watercraft propeller comprising the combination of

a hollow supporting body fixedly attached to the hull of said watercraft;

a rudder pivotably mounted on the downstream side of said supporting body,

a non-rotatable adjusting member mounted for generally linear movement on the downstream side of said hub, said adjustng member being coupled to an intermediate rotatable member coupled to said blades;

an adjusting linkage connected at one end to said adjusting member; and

a linear motor comprising a double-acting hydraulic piston and cylinder assembly mounted outside the hull of said watercraft in said body in spaced relationship from said watercraft propeller, said adjusting linkage comprising a two-armed pivotable adjusting lever with one arm thereof acting on said non-rotatable adjusting member and the other arm acted on by said linear motor, said motor being connected to the other end of said linkage so that linear motion of said motor sets the propeller pitch.

4,648,848

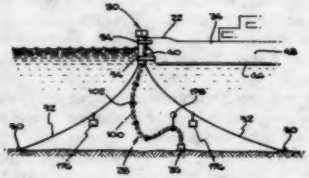
SPAR BUOY FLUID TRANSFER SYSTEM

Roger A. Busch, Cypress, Tex., assignor to Fluor Corporation, Irvine, Calif.

Filed Nov. 12, 1985, Ser. No. 796,989

Int. Cl.⁴ B63B *21/00*

U.S. Cl. 441—5 **14 Claims**



1. In a single spar buoy mooring apparatus having an axis and including an outer rotatable cylinder which supports a superstructure attachable to a vessel, and inner nonrotatable cylinder within the outer cylinder and connected by mooring lines to the sea floor, a riser system including multiple riser lines extending from a subsea installation to the top of said cylinders, and transfer lines extending from the superstructure to the vessel, the provision of:

means for connecting each riser line to an associated transfer line, said connecting means including

a turntable means carried by said superstructure and connected with each riser line;

and means for locking said turntable means against rotation relative to said superstructure whereby turning of the vessel about the axis of the spar buoy apparatus under locked condition imparts twist to said multiple riser lines;

said locking means being unlockable to allow said turntable means to return to a position where said riser system is untwisted.

4,648,849

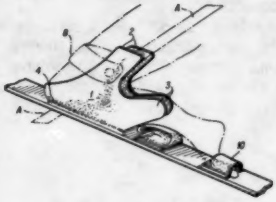
KNEE BINDINGS COMPATIBLE WITH ORDINARY WATER SKIS

F. Javier Moureal, 4242 Barker Hill Rd., Jamesville, N.Y. 13078

Continuation-in-part of Ser. No. 594,367, Mar. 28, 1984, abandoned, and Ser. No. 615,369, May 30, 1984, abandoned. This application Apr. 10, 1985, Ser. No. 721,686

Int. Cl.⁴ A63C *5/00*

U.S. Cl. 441—70 **3 Claims**



1. A water ski and knee binding assembly for permitting a skier to water ski while assuming a kneeling position comprising in combination:

a water ski;

a resilient front binding secured to the top of the water ski for receiving the front portion of a skier's foot, said front binding having side edges secured to the top of the water ski, a front transverse edge secured to the top of the water ski, and a rear edge spaced above the top of the water ski to form an opening therebetween;

a resilient heel binding secured to the top of the wter ski at a location aft of said front binding, said heel binding having a curved portion for receiving the heel of a skier's foot and a vertically extending poriton for supporting the ankle of the skier;

a resilient band secured transversely across the top of the water ski at a location aft of said heel binding, said band having side edges secured to said water ski and having front and rear edges spaced above the water ski to form a through passage therebetween; and

a knee binding for receiving the knee of a skier while in a kneeling position, said knee binding being in the form of a continuous sheet of flexible semi-rigid material, means for securing the bottom edge of the knee binding to the front and side edges of said front binding, said knee binding having a front portion for engaging the skier's knee, vertically extending side portions for covering one third to one half of the sides of the skier's thigh, and rearwardly extending side portions for covering one third to one half of the sides of the skier's calf;

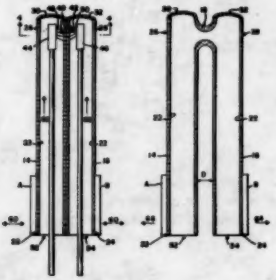
wherein said front and heel binding are used together for securing the foot of a skier while in the standing position and said front and heel bindings are used as a kneeling pad when the skier is in the kneeling position.

4,648,850

LOW-PRESSURE ARC DISCHARGE LAMP HAVING A COMMON PASSAGEWAY AND METHOD OF MANUFACTURING SAME

Joseph V. Lima, Salem, and Richard J. Shea, Danvers, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Feb. 24, 1986, Ser. No. 832,561
Int. Cl.[4] H01J 9/24, 9/26
U.S. Cl. 445—22 19 Claims



1. A method of manufacturing an envelope for an arc discharge lamp having at least two elongated adjacent glass tubes wherein said tubes are connected by a common passageway, said method comprising the steps of:

positioning said tubes in a contiguous relationship to define at least one common location of contact;

heating a preselected area of the internal surface of each of said tubes relative to said common location of contact to soften said glass to the extent a common passageway is defined between said tubes; and

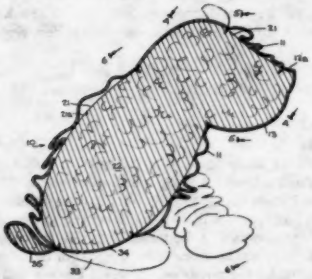
thereafter separating said tubes a predetermined distance while said glass is in said softened state to stretch said softened glass, thereby extending said common passageway between said tubes.

4,648,851

STUFFED ANIMAL WITH CHANGEABLE FEATURES

Ruth Rosenberg, New Rochelle, N.Y., assignor to Dena Smith-Migatz, New Rochelle, N.Y., a part interest

Filed Aug. 5, 1985, Ser. No. 762,578
Int. Cl.[4] A63H 3/02
U.S. Cl. 446—372 10 Claims



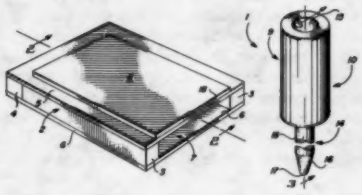
1. A stuffed animal comprising: a body including a face portion having an outer surface, a flexible covering sheet overlying at least one portion of said outer surface, and attachment means for attaching said covering sheet to said face portion at a plurality of spaced locations, said covering sheet having at least one portion thereof free of attachment to and overlying said one portion of said outer surface intermediate said spaced locations and said one portion of said covering sheet having a surface area which is greater than the surface area of said one portion of said outer surface which it overlies, said attachment means cooperating with said covering sheet for forming wrinkles in said one portion thereof, and said covering sheet being of a material having sufficient body to generally retain a new wrinkle-shape after being reshaped in response to direct external manipulation applied solely to the exterior surface of said covering sheet, whereby the shape and location of the wrinkles in said covering sheet overlying said one portion can be changed so as to vary the appearance of the stuffed animal.

4,648,852

TURKEY CALL

Landry R. Wingate, Rte. 2, Box 52, Pitkin, La. 70656

Filed Jun. 19, 1985, Ser. No. 746,286
Int. Cl.[4] A63H 5/00
U.S. Cl. 446—397 20 Claims



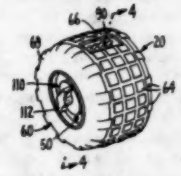
1. A turkey call comprising a generally rectangular-shaped call box having rectangular walls enclosing a rectangular-shaped box sound chamber in the interior of said call box; a rectangular-shaped opening provided in one end of said call box, said opening communicating with said box sound chamber; a slate striker plate secured to an outside surface of one of said walls of said call box, said slate striker plate being provided in substantially coextensive relationship with respect to said box sound chamber; and a striker characterized by a handle, a cylindrically-shaped open striker sound chamber provided in one end of said handle and a blunt striker tip projecting from the opposite end of said handle for engaging said slate striker plate on said call box and generating sounds which simulate the call of a wild turkey.

4,648,853

WHEEL HUB LOCKING MECHANISM

Rand Siegfried, San Carlos, Calif., assignor to Lewis Galoob Toys, Inc., South San Francisco, Calif.

Filed Oct. 9, 1985, Ser. No. 785,873
Int. Cl.[4] A63H 17/26, 17/00; B60B 15/20, 15/22
U.S. Cl. 446—448 20 Claims



1. A wheel assembly for a toy vehicle comprising:

a generally cylindrical, hollow shell having an axis coinciding with the axis of rotation of the wheel assembly, spaced

apart opposed sidewalls, one of which has an opening generally aligned with said axis, and a peripheral wall of a predetermined thickness, axial width and circumference;

a plurality of passages extending through the thickness of the peripheral wall at spaced intervals around the circumference;

a spider having a number of radially extending arms carried in said assembly for rotation relative to said shell about the axis inside the shell;

each said arm having a free end; an elongated lug pivotally mounted on each said arm adjacent the free end;

rotational biasing means mounted in said assembly urging the spider to rotate in one direction relative to said shell;

a hub having an outer side and an inner side; the hub being carried by the shell adjacent the one sidewall and for rotation relative to said shell about the axis with the outer side accessible for manual rotation;

means on the inner side of the hub for engaging the spider so that rotation of the hub effects rotation of the spider to move the part of each lug into and out of the shell through the passages;

axial biasing means mounted within said shell urging a portion of the hub against the one sidewall; and

positioning means on the hub cooperating with the one sidewall for latching the hub in either of two rotational positions corresponding to the part of each lug being either fully extended out of the shell or retracted inside the shell.

12. A toy wheeled vehicle with a wheel assembly mounted thereon comprising:

a relatively rigid, generally cylindrical, hollow shell including an axis coinciding with the axis of rotation of the wheel assembly, spaced apart sidewalls and a peripheral wall of a predetermined thickness and circumference;

a plurality of passages extending through the thickness of the peripheral wall at approximately equidistant points along the circumference;

one of the sidewalls having a generally centrally disposed opening;

a tire of a material that is more flexible than that of the shell and fits tightly over the shell;

the tire having a plurality of passages that align with the passages in the peripheral wall of the shell;

a spider coaxially mounted within the shell for rotation about the axis relative to the shell;

the spider having a number of radially extending arms;

each of the arms attached at one end adjacent the axis of the spider and having a radially extending free end;

first biasing means mounted within said shell and biasing the spider in one rotational direction relative to said shell;

an elongated extendable member pivotally connected at one end to the free end of each radially extending arm for pivotal movement about an axis generally parallel to said axis of rotation;

a hub with a flange mounted on said shell for manual rotation about said axis of rotation relative to the shell and for movement along said axis of rotation;

engaging means on the hub and spider cooperating upon manual rotation of the hub to move the other end of each of the extendable members into and out of the wheel through a respective passages one of said aligned passages extending through the shell and tire;

second biasing means axially biasing the hub relative to the shell; and means on the hub and the shell cooperating to selectively latch the hub in either of two rotational positions relative to the shell with the second biasing means cooperating with the latching means to retain the hub in one of the two rotational positions.

4,648,854

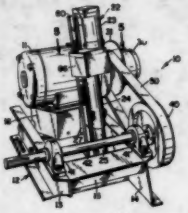
VARIABLE SPEED DRIVE

Gordon F. Redington, St. Paul, Minn., assignor to SnyderGeneral Corporation, Minneapolis, Minn.

Filed Dec. 21, 1984, Ser. No. 684,679

Int. Cl.[4] F16H 7/14

U.S. Cl. 474—114 1 Claim



1. A variable speed drive, comprising:

a fixed pulley mounted on a shaft adapted to impart rotary drive to a load;

a motor;

a variable pulley mounted on the shaft of said motor, said variable pulley of the type having one fixed face and one movable face to change the radius at which a drive belt contacts said variable pulley;

a drive belt engaging said variable and fixed pulleys;

pivot means pivotally mounting said motor for arcuate movement of the motor and the variable pulley to vary the distance between the variable and fixed pulleys, said pivot means permitting limited lateral movement of said motor and the variable pulley in a direction parallel to the motor shaft;

actuator means connected for controlling the pivotal position of said motor thereby to control the spacing of the variable face and the drive ratio of the drive; and

cam means positioned for engagement upon arcuate movement of said motor to cause lateral movement thereof in the direction parallel to the motor shaft to compensate for changes in the drive line of the variable pulley caused by movement of the movable side thereof, whereby to maintain the fixed pulley, the movable pulley and the drive belt in alignment throughout the range of variation in the drive ratio.

4,648,855

BELT GUARD

Herbert Palloch, Schwetzingen/Baden, and Hans Erndt, Wiesloch, both of Fed. Rep. of Germany, assignors to Frankl & Kirchner GmbH & Co KG, Schwetzingen/Baden, Fed. Rep. of Germany

Filed Feb. 18, 1986, Ser. No. 830,647

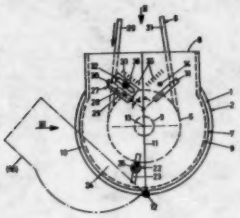
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1985, 3505627

Int. Cl.[4] B62J 13/00; F16P 1/02

U.S. Cl. 474—144 11 Claims

1. A belt guard for attachment to a casing of a clutch of a clutch motor for an industrial sewing machine having a V-belt pulley and a V-belt comprising: a cover which at least partially encloses a V-belt pulley and which has an opening for ingoing and outgoing V-belt sectios, a belt antidrop device located within the cover, its radial distance from the axis of the V-belt pulley being adjustable, the cover being divided along a plane parallel to the axis of the V-belt pulley, a joint connecting two cover halves to each other at the side of the cover opposite to the opening, the cover halves being connected to each other adjacent to the opening in such a way that they can be pulled apart, an ingoing belt safety device which comprises a safety pin extending into a wedge-shaped region between the ingoing belt section and the V-belt pulley, and a safety slide bar which

is attached in its turn to the outer side of a cover half in such a way that it can be detached if required, the safety pin being



attached to the safety slide bar and the safety pin penetrating at least one opening in the cover half and being adjustable within this opening.

4,648,856

ENDLESS BELT WITH TENSION CORDS AND METHOD OF MAKING SUCH A BELT

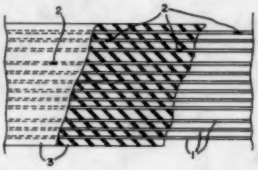
Yasuyuki Matsunaga, Kakogawa, Japan, assignor to Bando Kagaku Kabushiki Kaisha, Kobe, Japan

Filed Nov. 15, 1985, Ser. No. 798,625

Claims priority, application Japan, Nov. 21, 1984, 59-247394; Feb. 27, 1985, 60-039523; Feb. 28, 1985, 60-040881; Sep. 19, 1985, 60-143965[U]

Int. Cl.⁴ F16G *1/00*

U.S. Cl. 474—237 **12 Claims**



1. An endless belt comprising a bed of elastic material, a plurality of longitudinally extending, laterally spaced tension cords embedded in said bed, each of said cords having two ends and said ends being interconnected to form a junction, the junctions of said cords being distributed over the longitudinal length of said belt and said junctions being longitudinally offset one from the others.

4,648,857

ARMOURED V-SHAPED BELT WITH METAL CONTACTS

Bernard David, 20, rue Rambervillers, F-75012 Paris, France, and Roger Tetard, 5, rue de Bassano, F-75016 Paris, France

Continuation of Ser. No. 539,610, Oct. 6, 1983, abandoned, which is a continuation-in-part of Ser. No. 217,003, Nov. 21, 1980, abandoned. This application Jun. 9, 1986, Ser. No. 873,307

Claims priority, application France, Mar. 23, 1979, 7907340; PCT Int'l Appl., Mar. 19, 1980, PCT/FR80/00009

Int. Cl.⁴ F16G *1/22*

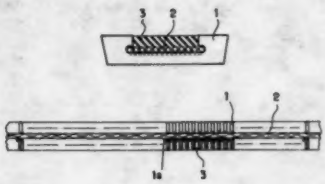
U.S. Cl. 474—272 **22 Claims**

17. In an endless v-shaped belt having a plane of symmetry, the belt transmitting movement by contact pressure with the groove of pulleys, the improvement comprising:

a plurality of spaced apart discrete elements disposed transverse to the longitudinal extent of said belt, each element including an upper portion having a recess;

a single thickness elongated element disposed in the recess of each said discrete element and lying in the plane of symmetry of said belt; and

elastomeric means for adhering to and joining said elongated



element with each of said discrete elements so that a unitary assembly is formed, said elastomeric joining means extending into said recesses and retaining said elongated element in each of said recesses.

4,648,858

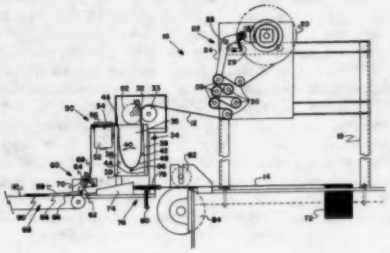
APPARATUS FOR MANUFACTURING A CIGARETTE FILTER TOW

Robert T. Lewis; James W. Sullivan; Kenneth M. Milliner, all of Louisville, and Byron L. Lowe, Prospect, all of Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Sep. 30, 1985, Ser. No. 781,170

Int. Cl.⁴ B31C *13/00*

U.S. Cl. 493—4 **14 Claims**



1. An apparatus for installing a hollow tube coaxially in a generally cylindrical filter rod comprising:

means for holding a supply of hollow tubing to be installed in the filter rod;

means for holding a supply of filter material web to be wrapped about the hollow tubing thereby forming the filter rod with the hollow tubing coaxially encased therein;

garniture means spaced from the tubing supply holding means and filter material web holding means for folding the filter material around the hollow tubing;

means for feeding the hollow tubing to the garniture means;

means for feeding the filter material web to the garniture means;

means for forming a loop in the hollow tubing between the hollow tubing supply holding means and the garniture means; and,

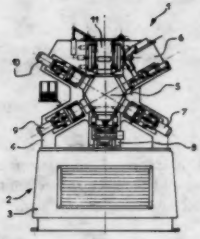
means for maintaining the loop size between a predetermined maximum and minimum size.

4,648,859

APPARATUS FOR APPLYING A SEALING MATERIAL TO THE EDGE OF A LENGTH OF PACKAGING

Georges Sireix, 9, rue Saint-Marc, 68400 Riedisheim, France

Filed Dec. 21, 1982, Ser. No. 451,953
Claims priority, application France, Dec. 23, 1981, 81 24260
Int. Cl.[4] B31B *1/90*
U.S. Cl. 493—105 12 Claims



1. Apparatus for applying a sealing material to the edge of a length of packaging formed from strips of selected materials, the apparatus comprising a frame having a base enclosure and a pair of substantially parallel vertically extending supports, each connected at one end of the base, the improvement comprising a rotatable drum carried between the supports and having a polygonal cross-section defining a plurality of peripheral facets, means associated with each of said facets for holding the packaging, a plurality of fixed operational assemblies interchangeably mounted substantially concentrically around and proximate to the periphery of said drum, whereby packaging carried by said drum may be steps from one of said assemblies to another to apply and secure the sealing material thereto, each of said holding means comprising a duct for carrying a fluid under pressure, a plurality of jacks operatively communicating with the duct and receiving the fluid under pressure, and a plurality of assemblies of vertical axes such vertical axes, made of flexible materials and supported by a central retaining element, having on the one hand, at their lower end a machined-down part and, on the other hand, a flat part facing the jacks and provided with horizontal bearings the opposite surface of which have an inclined face interacting by a camming action with a spacer which is firmly integrated with the end of the pistons of the jacks, wherein insertion of the spacer between the bearings causes the bearings to move apart, the bearings opposite one another being interlinked by an elastic element to bring back the vertical axes by elastic action to the release position when the spacer is withdrawn.

4,648,860

ENVELOPE WITH POUCH AND METHOD OF MANUFACTURE THEREOF

Russell A. Causey, Hamilton, New Zealand, assignor to Trigon Packaging Systems (NZ) Limited, New Zealand

Filed Feb. 21, 1985, Ser. No. 703,822
Claims priority, application New Zealand, Feb. 23, 1984, 207248
Int. Cl.[4] B31B *41/10*
U.S. Cl. 493—195 3 Claims

1. A method of producing a courier pack envelope incorporating an external pouch, characterized by the steps of:

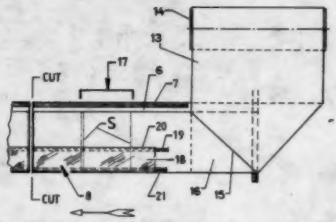
progressively folding a continuous sheet of plastics material to provide juxtaposed sheet portions interconnected at one of their longitudinal edges by the bight of said fold;

transporting said folded sheet in a longitudinal direction;

progressively feeding a continuous strip of plastics material of a determined width-longitudinally into face engagement with an outwardly presented face of one of said sheet portions;

progressively attaching one edge of said strip continuously to said face during the feeding of said strip; and,

sealing each of said folded sheet portions and said attached strip to each other at positions spaced longitudinally of said folded sheet, and along lines extending transversely of said folded sheet and said strip;



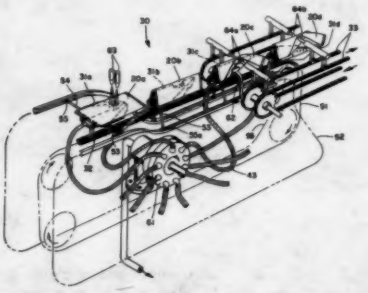
whereby said strip is attached to said outwardly presented face of one of said sheet portions along three of its edges, and defines an open-sided pouch in conjunction with said outwardly presented face of said one sheet portion.

4,648,861

FOLDING APPARATUS AND METHOD

Allan A. Pierce, Outagamie County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jun. 25, 1985, Ser. No. 748,658
Int. Cl.[4] B65H *45/30*
U.S. Cl. 493—333 13 Claims



1. An apparatus for folding sheets of flexible material, the apparatus comprising:

a plurality of folding boards each comprising means for folding the sheet, each folding board having a leading edge, a trailing edge and side edges, and further having a surface for contacting the sheet comprising four panels connected by three hinges, the first hinge being positioned and adapted for the folding board to bend between the first and second panel along a centrally located first fold line extending from the leading edge to the trailing edge, the second hinge being positioned and adapted for the folding board to bend between the first and third panels along a second fold line extending between the leading edge and one of the side edges, and the third hinge being positioned and adapted for the folding board to bend between the second and fourth panels along a third fold line extending between the leading edge and another of the side edges;

means connected to said folding boards for moving the plurality of folding boards in an endless loop, said endless loop having a straight line portion, thereby continually bringing each folding board into contact with a source of flexible sheets;

means contacting said folding boards for releasably retaining a flexible sheet on the folding boards during folding;

means to contact each folding board for bending each fold-

ing board along said first, second and third fold lines while said folding board is moving in said straight line portion of said endless loop;

means to apply adhesive to the flexible sheet retained on said folding board prior to folding for maintaining said sheet in its folded condition and clamping means are provided to hold the folded sheet in the adhesive area and to remove it from said folding board said clamping means moving in a straight line during said clamping.

8. A method of folding a sheet of flexible material, the method comprising:

providing a folding board for folding the sheet, the folding board having a leading edge, a trailing edge, and side edges, and further having a surface for contacting the sheet comprising four panels connected by three hinges, the first hinge being positioned and adapted for the folding board to bend between the first and second panel along a centrally located first fold line extending from the leading edge to the trailing edge, the second hinge being positioned and adapted for the folding board to bend between the first and third panels along a second fold line extending between the leading edge and one of the side edges, and the third hinge being positioned and adapted for the folding board to bend between the second and fourth panels along a third fold line extending between the leading edge and another of the side edges;

placing the sheet of flexible material on the surface of the folding board such that the front part of said sheet extends beyond the leading edge of the folding board;

causing the folding board to bend along the first fold line, thereby forming a first fold which is centrally and longitudinally located in the sheet;

causing the folding board to bend along the second and third fold line, thereby forming a second and third fold which both originate at a common base point on the first fold and which both extend from said common base point at an angle to the first fold to a respective side edge of the sheet thereby forcing said front part of said sheet downward creating a cup and an upwardly extending front portion in the garment formed from said sheet; and

removing the garment from the surface of the folding board.

4,648,862

MACHINE FOR MAKING PAPER BOOKLETS

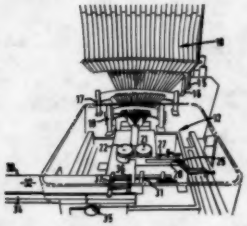
Stanley G. Jones, Mid-Glamorgan, Wales, assignor to Rizla Limited, Mid-Glamorgan, Wales

Filed Jun. 17, 1985, Ser. No. 745,128

Claims priority, application United Kingdom, Jun. 20, 1984, 8415758

Int. Cl.[4] B31D 5/00

U.S. Cl. 493—346 **26 Claims**



1. A machine for forming booklets of paper comprising:

a plurality of roller means for continuously providing strips of paper;

former means for converging paper strips withdrawn from said roller means into a single strand;

means for advancing the strand in a first direction;

a cutting station for reciprocably moving along the strand whereby a booklet length of the strand enters said cutting station while said cutting station moves counter to the strand in a second direction opposite the first direction;

a knife means disposed in said cutting station for cutting a booklet from the strand while said cutting station moves alongside the strand in the first direction; and

a driven shaft oriented normal to said first direction and having a constant velocity cam and a follower mounted thereon, said cutting station being connected by means of a pivoted link to said follower of said constant velocity cam;

a rotating shaft of non-circular cross-section extending through said cutting station parallel to said first direction and having a tubular sleeve slidably mounted thereon, said tubular sleeve being operably connected to said cutting station;

wherein reciprocal movement of said cutting station causes said tubular sleeve to slide in an axial direction along said rotating shaft; and

wherein rotation of said rotating shaft causes said tubular sleeve to actuate said knife means.

4,648,863

APPARATUS FOR THE PURE PREPARATION OF PARTICLES, BIOLOGICAL CELL SYSTEMS AND COLLOIDS

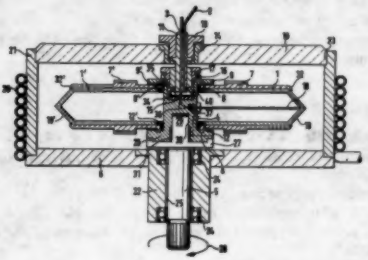
Stephan Nees, Munich, Fed. Rep. of Germany, assignor to Edmund Bühler, Tübingen-Weilheim, Fed. Rep. of Germany, a part interest

Filed Feb. 6, 1985, Ser. No. 698,573

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1984, 3404236

Int. Cl.[4] B04B 5/02

U.S. Cl. 494—17 **15 Claims**



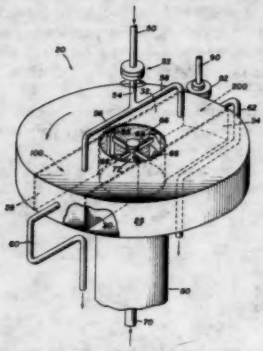
1. Apparatus for producing liquid density gradients from particles, biological cell systems, colloids and the like, comprising a variable-speed rotor, a substantially horizontal centrifuge container mounted on and rotatable by said rotor, said container having an end portion remote from the axis of said rotor, and a cannula disposed in said container and having an intake end adjacent said axis and a discharge end adjacent said end portion, said rotor having a passage for admission into said intake end, at a first rotational speed of the rotor, of lighter and thereupon of heavier constituents of the liquid density gradients whereby the admitted constituents form in the container a plurality of bands containing lighter and heavier materials with the bands containing heavier materials disposed at a greater distance from said axis than the bands containing lighter materials, such bands being formed while the container is rotated at a second speed and being withdrawable from the container by way of said cannula and said passage.

4,648,864

CENTRIFUGAL SEPARATOR AND METHOD OF SEPARATING BUOYANT PARTICLES FROM A LIQUID

Timothy J. Evans, Aurora, and Richard J. Kooy, Woodridge, both of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Dec. 26, 1984, Ser. No. 686,592
Int. Cl.[4] B04B *11/08*
U.S. Cl. 494—37 20 Claims



1. A method of separating solid particles present in a liquid in which they are buoyant comprising:

feeding a liquid containing the solid particles into a plurality of elongated chambers having a longitudinal center line substantially lateral to an axis of rotation while the chambers are rotated about said axis to apply centrifugal force on liquid in the chambers thereby causing the buoyant solid particles to move radially inward and produce a pack in each chamber while the liquid thereby freed of solid particles flows radially outwardly;

continuously withdrawing liquid freed of solid particles from the chambers; and

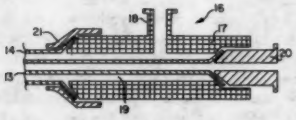
continuously removing solid particles from the packs in the chambers.

4,648,865

DEVICE FOR IN VIVO PURIFICATION OF BLOOD

Karl Aigner, Uhlandstr. 5, 6301 Pohlheim 1, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 518,449, Jul. 29, 1983, Pat. No. 4,563,170. This application Jan. 11, 1985, Ser. No. 689,611
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1984, 3400874
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—4 1 Claim



1. A double lumen catheter for the simultaneous withdrawal from and introduction into the vena cava, in the vicinity of the heart, of blood at a rate of at least 600 ml/min while minimizing flow disturbances in the vein, in intra-arterial chemotherapy, with a coaxial arrangement of the two catheter tubes, in which the outer tube is shorter than the inner tube forming the open catheter tip, and has lateral suction openings,

(1) wherein the inner tube (13) is 4–6 cm longer than the outer tube (14),

(2) wherein, beginning from the tip (12) there are provided 4 pairs of lateral openings (11) at mutual spacings of between 8 and 12 mm each,

(3) wherein the outer tube (14) at its end has, over a length of 3.5–6 cm, 4 pairs of lateral openings (11) at a mutual spacing of 8–12 mm each, and

(4) wherein the transition from the outer tube (14) to the inner tube (13), which is smooth, includes a ring (15) of a material which is detectable, through contrast formation, under X-ray radiation,

(5) wherein at the rear end of the catheter there is provided a branched connecting member (16) in the form of a sleeve (17) into which the end of the inner catheter tube (13) is inserted and to which the ends of the catheter tubes (13,14) are attached by clamping, the inner bore (19) of said sleeve being larger than the outer diameter of the catheter inner tube (13) so that between the catheter inner tube (13) as inserted into the sleeve (17) and the bore wall there is provided an annular gap,

(6) wherein said sleeve (17) has a lateral connecting stud (18) having a bore which is in communication with said annular gap,

(7) wherein said sleeve (17) has a conically tapered front end and, rearwardly of said tapered front end, an outer thread,

(8) wherein there is provided at said end a cap nut (21) engaging said thread so as to clamp the rear end of the outer tube (14) to the front end of said sleeve (17),

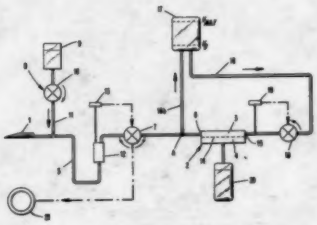
(9) wherein the rear end of the sleeve (17) has a tapered portion and, rearwardly of said tapered portion, an inner thread, and wherein at said rear end of the sleeve (17) there is provided a conical member (20) having a tapered front end and, rearwardly thereof, an outer thread for clamping the rear end of the inner tube (13) to the end of the sleeve (17), said conical member being designed to be screwed into said inner thread of the rear end of the sleeve and having a bore passing all the way therethrough.

4,648,866

PROCESS/APPARATUS FOR THE WITHDRAWAL/RETURN OF BODY FLUIDS

Jean-Michel Malbrancq, Thiais, and Georges Vantard, Villefontaine, both of France, assignors to Rhone-Poulenc S.A., Courbevoie, France

Filed Jul. 9, 1984, Ser. No. 628,845
Claims priority, application France, Jul. 7, 1983, 83 11572
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—5 14 Claims



1. Apparatus for processing of body fluids, comprising (i) means for withdrawing and returning body fluid from and to a living patient; (ii) a body fluid separating module which comprises a first compartment, a second compartment and a semi-permeable membrane disposed between said first and second compartments, said semi-permeable membrane being permeable to a liquid fraction of the body fluid, said second compartment being adapted to receive liquid fraction which permeates through said semi-permeable membrane from said first compartment; (iii) first passage means communicating said with-

drawal and return means (i) with the upstream first compartment of said separating module (ii); (iv) first pumping means provided at a location along said first passage means (iii) for pumping body fluid in either direction through said first passage means; (v) first sensor means controlling said first pumping means (iv), said first sensor means adapted to monitor pressure of body fluid passing through said first passage means (iii), said first sensor means operatively provided between said withdrawal and return means (i) and said first pumping means (iv); (vi) means for collecting from the second compartment the liquid fraction received by the second compartment; (vii) second passage means communicating an end of the first compartment (viii) with container means, (ix) third passage means communicating said container means (viii) with another end of said first compartment so that said second and third passage means and said first compartment define a circulation path, said first passage means communicated with said circulation path at a juncture with said third passage means; (x) second pumping means on said circulation path for pumping body fluid through said circulation path, whereby a pressure may be maintained in said first upstream compartment greater than that in said second downstream compartment; and (xi) means for controlling said second pumping means so that the pressure difference across said semi-permeable membrane does not exceed a predetermined value.

4,648,867

TAMPON SYSTEM AND METHOD

James M. Conner, Old Greenwich, Conn.; Daniel K. Harden, Brooklyn, N.Y., and Donald M. Genaro, Haworth, N.J., assignors to Henry Dreyfuss Associates, New York, N.Y.

Continuation of Ser. No. 751,425, Jul. 3, 1985, abandoned. This application Mar. 19, 1986, Ser. No. 842,377

Int. Cl.[4] A61F *13/20*

U.S. Cl. 604—14 **16 Claims**

1. A tampon system comprising;

a tampon;

an impermeable sheath which surrounds the tampon and is open at one end, said sheath being unattached to said tampon;

a broad-collared ring (i) which has an unobstructed opening therein for passage and withdrawal of a finger and the sheath and (ii) to which the open end of the sheath is affixed such that the opening in the sheath registers with the opening in the ring; and

a sanitary sealing closure which is removably secured over the opening in the ring, the above elements being arranged such that

(a) the portion of the sheath which contacts the bodily opening is kept sanitary,

(b) the tampon, the sheath, and a finger can pass through the opening for digital insertion and location of the tampon,

(c) while inserting the tampon, the finger is protected by the impermeable sheath from soiling, and

(d) the sheath can be retracted through the opening to provide for clean disposal of the used sheath.

4,648,868

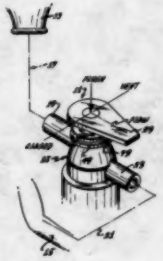
APPARATUS FOR CONTROLLING FLOW AND PRESSURE MEASUREMENT

Martha K. Hardwick, Tustin; Kelly A. Pike, Laguna Hills; George D. Evans, II, Arlington; Ronald Edwards, San Clemente, and Jacob J. Norman, Westminster, all of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Sep. 30, 1985, Ser. No. 782,032

Int. Cl.[4] A61B *5/02*; F16K *21/00*

U.S. Cl. 604—32 **19 Claims**



1. An apparatus comprising:

a valve body having a chamber and first and second ports communicating with said chamber;

a valve element mounted at least partially in the chamber of the valve body for rotational movement relative to the valve body between first and second rotational positions and for axial movement relative to the valve body between first and second axial positions;

said valve element and said valve body cooperating to define a flow passage between said ports which provides different flow characteristics in the first rotational position than in the second rotational position when the valve element is in said first axial position; and

means responsive to movement of the valve element to the second axial position at least when the valve element is at the first rotational position for providing for flush flow through said chamber and between said ports with the flush flow being greater than the flow in either of said rotational positions with the valve element in said first axial position.

4,648,869

AUTOMATIC INFILTRATION DETECTION SYSTEM AND METHOD

Donald E. Bobo, Jr., Irvine, Calif., assignor to American Hospital Supply Corporation, Deerfield, Ill.

Filed Dec. 4, 1985, Ser. No. 804,675

Int. Cl.[4] A61M *5/00*

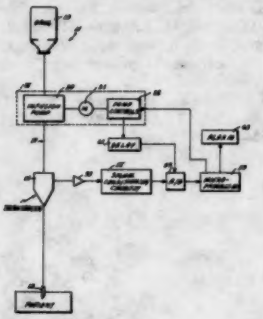
U.S. Cl. 604—49 **21 Claims**

1. An infusion system for infusing a flowable material into a patient comprising:

an infusion device for delivering the flowable material, said infusion device including means for delivering the flowable material in a normal delivery pattern and for delivering a test pulse of the flowable material with the test pulse being different from the normal delivery pattern and with the test pulse providing an increased flow rate of flowable material;

conduit means for conducting the flowable material from the

infusion device to the patient, said test pulse creating a pressure wave response in the conduit means; and



means responsive to the pressure wave response in the conduit means for detecting if the flowable material is being improperly supplied by the conduit means to the patient.

4,648,870

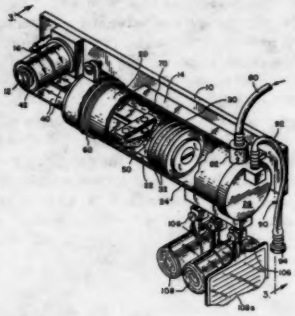
DEVICE FOR EVACUATING BODY FLUIDS

Edward M. Goldberg, 225 Maple Hill Rd., Glencoe, Ill. 60022, and Seymour Bazell, 9235 N. Latrobe, Skokie, Ill. 60077

Division of Ser. No. 520,434, Aug. 4, 1983, Pat. No. 4,525,167, which is a division of Ser. No. 184,235, Sep. 5, 1980, Pat. No. 4,404,924. This application May 10, 1985, Ser. No. 733,496

Int. Cl.[4] A61M *1/06*

U.S. Cl. 604—135 **10 Claims**



1. In a suction device used to effect drainage from a body wound and to effect disposal of said drainage without spread of contamination from said drained body fluids; the improvement comprising, in combination:

means defining a support frame;

elongated, suction cylinder means mounted on the frame, and providing, adjacent one end of said elongated suction cylinder means, both (a) a contaminated fluid intake means to the interior of the suction cylinder means, for communicating with the source of contaminated body fluids to be drained, and through which contaminated body fluids are to be drawn by a subatmospheric pressure into the suction cylinder means, and (b) drainage bore means, spaced from said intake means and positioned to receive, from the suction cylinder means, contaminated body fluids that are to be discharged from the suction cylinder means under pressure;

a check valve means, in the portion of said fluid intake means to the suction cylinder means, providing for flow therethrough of contaminated body fluids in only one direction, namely, from the source of contaminated body fluid to the interior of the suction cylinder means, and said check valve means preventing any reverse flow of contaminated body fluids from the suction cylinder means back through the check valve means;

said drainage bore means extending from the suction cylinder means, and being constructed to provide a manifold with a plurality of flow distributing conduits for receiving thereinto contaminated body fluids from the interior of the suction cylinder means;

a plurality of normally closed, but selectively openable, isolation valve each in operative association with one flow distributing conduit, the flow distributing conduits being spaced from each other along the length of said manifold, and each being operatively disposed between said manifold, and through an opened isolation valve with an associated empty receptacle means that is adapted to receive thereinto contaminated body fluid that is being discharged from the interior of the suction cylinder means through the manifold's flow distributing conduit means and associated isolation valves;

a movable piston means within and operatively associated with said suction cylinder means for first drawing contaminated body fluids through said check valve means into the interior of the suction cylinder means to be held therein for later selective discharge therefrom through the flow distributing passageway means of the manifold means;

each isolation valve being originally closed to prevent flow therethrough but being adapted to be individually selectively opened to provide for discharge of contaminated body fluid, pressurized by the piston means located in the interior of the suction cylinder means, into selected ones of empty receptacles each associated with one of the originally, normally-closed isolation valves;

each opened isolation valve being adapted to be selectively closed after its associated empty receptacle has received therein a selected amount of contaminated body fluid discharged from the cylinder means under pressure from the movable piston means; and

the selective closing of the isolation valve being operative to prevent back flow of contamined body fluid from the receptacle therefor to the suction cylinder means.

4,648,871

SUCTION CATHETER

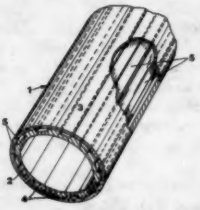
Peter Jacob, Söderfors, Sweden, assignor to Mediplast AB, Solna, Sweden

PCT No. PCT/SE83/00245, § 371 Date Feb. 14, 1985, § 102(e) Date Feb. 14, 1985, PCT Pub. No. WO85/00016, PCT Pub. Date Jan. 3, 1985

PCT Filed Jun. 14, 1983, Ser. No. 711,505

Int. Cl.[4] A61M *37/00*

U.S. Cl. 604—149 **3 Claims**



1. A suction catheter for the suction of body fluid adapted to be connected to a suction means, said catheter comprising:

an outer tube;

an inner tube disposed within said outer tube and forming an integrated unit therewith, said inner tube further comprising ridges disposed around the outside of said inner tube,

said ridges contacting said outer tube thereby defining air channels between said inner and outer tubes;

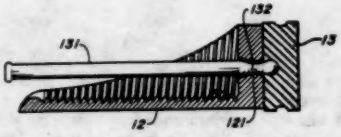
wherein said outer tube is made of a material with a higher shrinkability than the inner tube, and wherein said outer tube is longer than said inner tube such that the portion of said outer tube which exceeds the length of the inner tube slightly tapers so that communication between said air channels and a suction channel within said inner tube is maintained.

4,648,872

VOLUMETRIC PUMP WITH REPLACEABLE RESERVOIR ASSEMBLY

Dean L. Kamen, 46 Gage Rd., Bedford, N.H. 03102

Filed Nov. 15, 1983, Ser. No. 551,851
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—155 **7 Claims**



1. A volumetric pump, comprising:

reservoir means for providing a reservoir of variable volume, including a piston located within the reservoir means which when axially displaced causes a change in reservoir volume;

drive means in mechanical connection with the piston, for displacing the piston when such means is engaged against a rotating member having a component of angular velocity in the direction of piston displacement, such drive means having an interior drive surface that is substantially a longitudinal section of a surface of revolution about a first axis substantially parallel to the direction of piston displacement, such interior drive surface being threaded for a length at least as great as the desired total piston displacement;

a rotating, axially non-displaceable drive screw which is short in comparison to the displacement of the piston and has an axis or rotation approximately coincident with the first axis, in engagement with the interior drive surface, for displacing the piston;

wherein the reservoir means and drive means form an assembly that is removably engageable against the drive screw; and

sever-connection means, for temporarily connecting the piston to the drive means, for movement of the drive means when so connected to the piston both to increase and to decrease the volume of the reservoir means, in such a way that the sever-connection means must be severed to permit placing of the drive means in engagement with the drive screw, and so that following such severence the piston is no longer connected to the drive means and can then be moved only to decrease the volume of the reservoir means.

4,648,873

ADAPTER FOR INTRAVENOUS DELIVERY SET

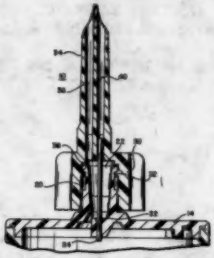
Thomas P. Robinson, Plano, Tex., assignor to Quest Medical, Inc., Carrollton, Tex.

Filed May 6, 1985, Ser. No. 731,013
Int. Cl.[4] A61B *19/00*
U.S. Cl. 604—411 **4 Claims**

1. In combination with a syringe-venting connector having an inlet, an outlet, a liquid flow path there-through for conveying fluid in a first direction, a separate air vent conduit extending centrally of the liquid flow path outwardly of the inlet for venting air in the direction opposite said first direction, the air vent conduit extending essentially concentric with the axis of symmetry of the inlet, and having fastening means adjacent the connector inlet for engaging a threaded syringe outlet, an IV container adapter for releasable securement to the connector comprising:

a hollow body having means for secure engagement to the connector inlet;

a spike for piercing an I.V. fluid container, said spike extending from the hollow body and having a liquid flow path



therein which communicates with the liquid flow path of the connector when the body is engaged with the connector, the opening of the liquid flow path in the spike into the liquid flow path of the connector being radially spaced from the axis of symmetry; and

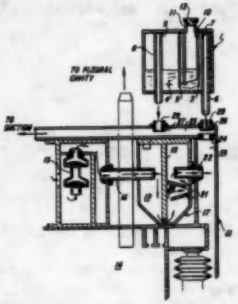
means carried by the hollow body being essentially concentric with the axis of symmetry when the body is engaged to the connector to prevent the exit of air from the connector air vent conduit within the path of the liquid flowing through the adapter and connector flow path in said first direction.

4,648,874

AIR LEAK DETECTION CHAMBER FOR DRAINAGE DEVICE

Leonard D. Kurtz, Woodmere, and Joseph LiCausi, Port Jefferson Station, both of N.Y., assignors to BioResearch Inc., Farmingdale, N.Y.

Filed Feb. 22, 1985, Ser. No. 704,280
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—321 **5 Claims**



1. An air leak detector for a drainage device wherein the drainage device includes a collection chamber for collecting fluids and a passageway leading from the collection chamber, said air leak detector including a container having a first compartment and a second compartment, partition means separating said compartments and having an opening at the lower end

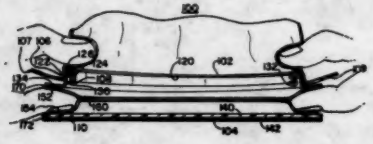
thereof to provide a passageway between the first and second compartments, means in said container providing a path for gas flow from the collection chamber into said first compartment and from said second compartment into said passageway leading from the collection chamber, and air leak detection means within said container for collecting gas passing out of said collection chamber, said air leak detection means including a separate chamber disposed in said first compartment and having a closed upper end and an open lower end.

4,648,875

OSTOMY BAG COUPLING

Keith T. Ferguson, Scotch Plains, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 26, 1985, Ser. No. 759,560
Int. Cl.[4] A61F 5/44
U.S. Cl. 604—339 **7 Claims**



1. An ostomy apparatus comprising a bag, an adhesive-backed label and means for releasably connecting said bag and label, said connecting means further comprising first and second interengaging parts, each of closed loop form for defining a stoma aperture therein, said first part coupled to said bag, said connecting means further comprising mounting means for mounting said second part on said label, said mounting means comprising:

first and second sections coupled together at an inner periphery to form a stoma aperture therein, said first section coupled to said second part and said second section coupled to said label only at an outer peripheral region spaced apart from said inner periphery so that said second section is movable or spaced away from said label in the region of the stoma aperture.

4,648,876

BREATHABLE PANTY LINER

Patricia E. Becker, Manalapan Township, Monmouth County, and Kenneth J. Molee, Hightstown, both of N.J., assignors to Personal Products Company, Milltown, N.J.

Filed Sep. 24, 1982, Ser. No. 423,389
Int. Cl.[4] A61F 13/16
U.S. Cl. 604—370 **12 Claims**

1. A panty liner to be worn in the crotch portion of an undergarment comprising:

a central body fluid absorbent core having a body facing side and a garment facing side;

said garment facing side being overlaid by at least one ply of a fibrous, vapor permeable, liquid repellent layer for protecting said undergarment from body fluids while allowing evaporated, body fluids to pass therethrough;

said ply having a degree of repellency of at least 3.0 cm of water and an air permeability of at least 20 $ft.^3/ft.^2/min$; and

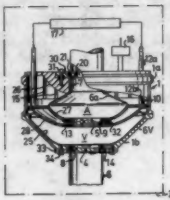
said panty liner having an air permeability of at least 10 $ft.^3/ft.^2/min$.

4,648,877

BLOOD PUMP

Stig Lundbäck, Vaxholm, Sweden, assignor to Astra-Tech Aktiebolag, Stockholm, Sweden

Filed Apr. 26, 1985, Ser. No. 709,557
Claims priority, application Sweden, Mar. 30, 1984, 8401778
Int. Cl.[4] A61F 2/22
U.S. Cl. 623—3 **16 Claims**



1. A blood pump comprising an atrium chamber defined by flexible walls and having an inlet and an outlet, a ventricle chamber defined by flexible walls and having an inlet and outlet, a passage communicating the outlet of the atrium chamber with the inlet of the ventricle chamber, a first one-way valve in the passage adapted to permit blood flow only from the atrium chamber to the ventricle chamber, a second one-way valve in the outlet from the ventricle chamber adapted to permit blood to flow through the outlet only out of the ventricle chamber, a casing having first and second openings, means connecting the atrium chamber inlet to the first opening and the ventricle chamber outlet to the second opening such that the flexible walls defining the chambers are movably supported in the casing, and drive means for periodically moving the walls of the ventricle chamber to decrease the volume thereof and expel blood therefrom while simultaneously moving the walls of the atrium chamber such that its volume may increase upon inflow of blood into the inlet thereto, the drive means including a drive ring surrounding and joined to the passage and having a surface engageable with the walls of the ventricle chamber, characterized in that said surface is engageable over a selected varying area such that the pressure of blood entering the ventricle chamber betwen driven strokes of the drive means controls the output of the blood pump by establishing the magnitude of the return stroke of the drive ring as a function of a pressure force acting over the area of engagement between the drive ring and the walls of the ventricle chamber and in that the drive means engages the drive ring only during the driven stroke of the pump and disengages from the drive ring and moves to a retracted position during the return stroke of the pump, whereby the return stroke of the drive ring is provided solely by said pressure force.

4,648,878

POSTERIOR CHAMBER LENS IMPLANT

Charles D. Kelman, 269 Grand Central Pkwy., Bldg. 3, Floral Park, N.Y. 11005

Filed Dec. 23, 1985, Ser. No. 812,256
Int. Cl.[4] A61F 2/16
U.S. Cl. 623—6 **14 Claims**

1. A posterior chamber intraocular lens intended for implantation in a human eye after extracapsular cataract extraction, said lens comprising:

a substantially rigid optic having a curved front surface, a continuous substantially planar rear face having a pair of opposed peripheral portions each having an outer edge, said rear face having a mid-portion between said pair of peripheral portions,

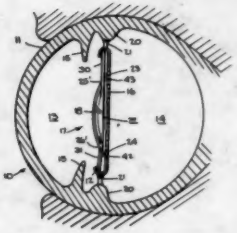
means for securing said optic to the eye such that said planar rear face is inclined with respect to the posterior capsule, said outer edge of one of said peripheral portions being

adapted to contact the posterior capsule and said outer edge of the other of said peripheral portions being spaced from the posterior capsule, said means for securing said optic within the eye including first position-fixation means connected to said optic in the region of said one of said pair of peripheral portions and second position-fixation means connected to said optic in the region of said other of said pair of peripheral portions, said first position-fixation means and said second position-fixation means cooperating with said optic for positioning said outer rear edge of said one peripheral portion in deforming contact with the posterior capsule and for positioning said outer rear edge of said other peripheral portion at a location spaced from the posterior capsule, said inclination of said planar rear face being such that said mid-portion is spaced from the posterior capsule by a distance sufficient to safely allow a subsequent laser posterior capsulotomy.

4,648,879
POSTERIOR CHAMBER INTRAOCULAR LENS

Charles D. Kelman, 269 Grand Central Pkwy., North Shore Towers, Floral Park, N.Y. 11005

Filed Nov. 18, 1985, Ser. No. 798,986
Int. Cl.[4] A61F 2/16
U.S. Cl. 623—6 10 Claims



1. A posterior chamber intraocular lens intended for implantation in the capsule of an eye after extracapsular extraction, comprising:

a medial, light-focusing, lens body having a rear face,

a pair of discrete tab means extending generally radially outwardly from opposite peripheral portions of said lens body and integral therewith,

position-fixation means extending from said tab means and cooperating with said lens body, for centering said lens within said chamber,

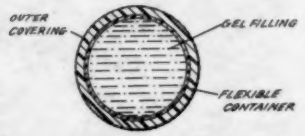
a pair of projection respectively integral with said tab means at locations thereon closely adjacent to but radially outward of said opposite peripheral portions, respectively, of said lens body and extending rearwardly behind the plane containing said rear face of said lens body, each of said projections being shaped so as to make substantially only single point contact with said posterior capsule,

said position-fixation means being adapted to act directly on said projection to press said projection against the posterior capsule for spacing a central portion of the posterior capsule away from said rear face a distance sufficiently large to safely allow a subsequent laser capsulotomy.

4,648,880
IMPLANTABLE PROSTHETIC DEVICES

Daniel Brauman, 141 Brush Hollow Crescent, Rye Brook, N.Y. 10572

Filed Aug. 30, 1984, Ser. No. 630,124
Int. Cl.[4] A61F 2/12
U.S. Cl. 623—8 7 Claims



6. In a breast prosthesis comprising a flexible container approximating the shape of the human breast and a soft gel or liquid filling said container;

the improvement which comprises providing an outer, rough textured plastic covering made of polyester fibers and which encases the flexible container and has an outer surface having a multiplicity of pores and/or interstices.

4,648,881
IMPLANTABLE BIOLOGICAL TISSUE AND PROCESS FOR PREPARATION THEREOF

Alain Carpentier; Sophie Carpentier, both of Paris, France, and Aws S. Nashef, Costa Mesa, Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Nov. 29, 1982, Ser. No. 445,345
Claims priority, application France, Mar. 23, 1982, 82 04892
Int. Cl.[4] A61F 2/02, 2/06, 2/24
U.S. Cl. 623—11 38 Claims

1. A process for treating biological tissue prior to implantation which comprises the steps of:

a. contacting said tissue with a phosphate-deficient solution, said solution having a level of phosphate decreased to an amount effective in reducing calcification of said tissue after implantation, said solution further being non-destructive or non-destabilizing to said tissue; and

b. maintaining the tissue in contact with such a phosphate-deficient solution during fixation, sterilization, and post-fixation storage of said tissue.

4,648,882

POWDERY CARPET CLEANING PREPARATION CONTAINING ZEOLITE GRANULATE

Rainer Osberghaus, Duesseldorf, and Franz Kresse, Hilden, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 10, 1985, Ser. No. 807,390

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1984, 3444959

Int. Cl.[4] C11D *3/12, 7/50, 17/06;* D06L *1/04*

U.S. Cl. 8—142 18 Claims

1. A dry cleaning preparation in powder form for cleaning carpets and fabric which preparation consists essentially of

(a) from 40 to 90% by weight of zeolite,

(b) from 0.5 to 15% by weight of at least one surfactant,

(c) from 5 to 30% by weight of at least one organic dry cleaning solvent,

(d) from 1 to 20% by weight of at least one granulating aid,

(e) from 0 to 10% by weight of at least one solid, water-soluble acid, and

(f) from 0 to 10% by weight of other customary constituents of dry cleaning preparations in powder form,

wherein at least components (a), (d), and (e) are combined to form a porous zeolite granulate which withstands the mechanical stressing normally encountered in dry cleaning and contains less than 2% by weight of particles 0.05 mm in size and smaller and less than 5% by weight of particles larger than 2 mm as determined by sieve analysis and have a mechanical stability when subjected to a vibrating ball mill filled with about 5 porcelain balls 28 mm in diameter for 1 minute at 1400 rpm and then sieved, such that the proportion of particles up to 0.2 mm in size increases to no more than 15% by weight, based on the total weight of the granulate, and wherein this granulate is then united with components (c), (f) and the remaining parts of (b).

7. A process for cleaning carpets and textiles, characterized in that the dry cleaning preparation of claim 1 is applied to the textile in quantities of from 20 to 200 grams per square meter and is intensively rubbed into the textile for 0.5 to 2.5 minutes per square meter, the soil and cleaning preparation combining with one another, after which the residues are mechanically removed from the textile.

4,648,883

PROCESS FOR THE PREPARATION OF STORAGE STABLE AQUEOUS FORMULATIONS OF ANIONIC DYES: AMON EXCHANGE RESIN TREATMENT

Nitya G. Podder, Birsfelden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 16, 1985, Ser. No. 755,381

Claims priority, application Switzerland, Jul. 25, 1984, 3601/84

Int. Cl.[4] B01F *3/12;* C09B *67/34;* D06P *1/61*

U.S. Cl. 8—527 14 Claims

1. A process for the preparation of a storage stable aqueous formulation of anionic dyes, which process comprises treating the aqueous dye solution or dispersion with a polymeric anion exchange resin, simultaneously or subsequently subjecting the resin-bonded dye to a mechanical wet grinding, in the presence of a nonionic dispersant, and adding to the resultant aqueous dispersion the assistants customarily present in the liquid dye formulations.

4,648,884

SOLUTIONS OF ANIONIC DYES WITH ALKYLENE GLYCOL MONO-ALKYL ETHERS

Zdenek Koci, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 17, 1985, Ser. No. 755,887

Claims priority, application Switzerland, Jul. 26, 1984, 3622/84

Int. Cl.[4] C09B *67/26;* D06P *1/39*

U.S. Cl. 8—527 9 Claims

1. A solution of anionic dye which consists essentially of:

(a-1) at least one anionic dye; and

(a-2) at least one solvent selected from the group consisting of propylene glycol C_1–C_4-monoalkyl ether, butylene glycol C_1–C_4-monoalkyl ether, and a C_1–C_4-carboxylic acid esters of such ethers;

or

(b-1) at least one anionic dye; and

(b-2) at least one solvent selected from the group consisting of propylene glycol C_1–C_4-monoalkyl ether, butylene glycol C_1–C_4-monoalkyl ether, and a C_1–C_4-carboxylic acid esters of such ethers; and

(b-3) water.

4,648,885

PROCESS AND COMPOSITION FOR STABILIZED DISTILLATE FUEL OILS

Dwight K. Reid, Houston, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Jun. 13, 1986, Ser. No. 874,259

Int. Cl.[4] C10L *1/22*

U.S. Cl. 44—57 17 Claims

1. A process for stabilizing distillate fuel oil which comprises adding to said fuel oil an effective stabilizing amount of a mixture of (a) N-(2-aminoethyl)piperazine, (b) triethylenetetramine, and (c) N,N-diethylhydroxylamine.

4,648,886

MODIFIED SUCCINIMIDES (V)

Thomas F. Buckley, III, Hercules, and Robert H. Wollensberg, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 722,910, Apr. 12, 1985, abandoned. This application Jan. 16, 1986, Ser. No. 819,643

Int. Cl.[4] C10L *1/22*

U.S. Cl. 44—63 28 Claims

1. A polyamino alkenyl or alkyl succinimide wherein one or more of the nitrogens of the polyamino moiety is substituted with

wherein R_4 is hydrocarbyl of from 1 to 30 carbon atoms; R_5 is selected from the group consisting of hydrocarbyl of from 2 to 30 carbon atoms and $—R_6—OR_6—_p$ wherein R_6 is alkylene of from 2 to 5 carbon atoms and p is an integer from 1 to 100; and m is an integer of from 0 to 1.

4,648,887

METHOD FOR CONTROLLING ELECTROSTATIC PRECIPITATOR

Takaaki Noda, and Hiroshi Terai, both of Hiratsuka, Japan, assignors to Sumitomo Heavy Industries, Ltd., Japan

Filed Aug. 12, 1985, Ser. No. 765,046

Int. Cl.[4] B03C *3/68*

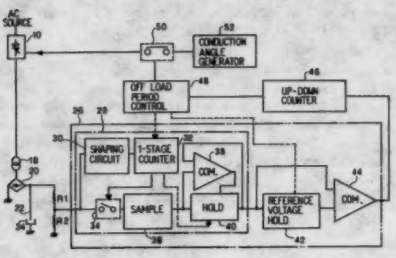
U.S. Cl. 55—2 18 Claims

1. A method for controlling an electrostatic precipitator which includes discharging electrodes and collecting electrodes and which is supplied with a rectified secondary high voltage from a high voltage generating apparatus switchably

connected to an AC source, said method comprising the steps of:

applying a secondary voltage to the electrostatic precipitator in a duty cycle by alternating (i) an on-load period of connection to the AC source for a fixed time length corresponding to at least one cycle of the AC source, and (ii) an off-load period of adjustable time length, the secondary voltage having a series of peaks and valleys;

providing at suitable intervals a compulsory off-load pause period, corresponding to at least 10 cycles of the AC source, to drop the secondary voltage;



detecting the bottom value of a first valley in the secondary voltage in the first on-load period immediately after each compulsory pause period, said valley bottom being a reference voltage for back ionization detection;

comparing the voltage at the bottom of an odd-numbered valley in the secondary voltage in each on-load period after the above compulsory pause period, a back ionization being detected if said compared bottom voltage is substantially less than the reference voltage; and

adjusting the time length of the next off-load period by one cycle of the AC source on the basis of the determination made in said comparing step.

4,648,888

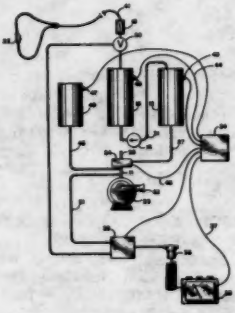
OXYGEN CONCENTRATOR

Robert O. Rowland, Hemet, Calif., assignor to Hudson Oxygen Therapy Sales Co., Temecula, Calif.

Continuation-in-part of Ser. No. 635,595, Jul. 26, 1984, Pat. No. 4,561,287, which is a continuation-in-part of Ser. No. 396,705, Jul. 9, 1982, Pat. No. 4,516,424. This application Oct. 31, 1985, Ser. No. 793,205

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—21 **18 Claims**



1. In an oxygen concentrator comprising one or more molecular sieve beds for receiving atmospheric air and for selectively adsorbing nitrogen therefrom to increase the oxygen concentration of a product gas recorvered therefrom, a reservoir for receiving said product gas from said one or more sieve beds, a surge tank for receiving atmospheric air and for charging said one or more sieve beds therewith, a compressor and a valve cooperating therewith for charging said one or more sieve beds and said surge tank with atmospheric air, valve switching means for alternately charging said one or more sieve beds and said surge tank, and means for withdrawing said product gas from said reservoir, the improvement comprising:

means for sensing the rate of withdrawal of product gas from said reservoir, and

means for switching said valve for charging said surge tank for a minimum time required to produce product gas of a selected oxygen concentration at the sensed rate of product gas withdrawal from said reservoir.

4,648,889

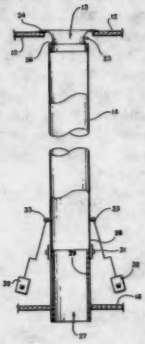
TOP INLET BAGHOUSE CONSTRUCTION

Robert M. Jensen, 210 Monte Diablo, San Mateo, Calif. 94401

Filed May 3, 1985, Ser. No. 730,101

Int. Cl.[4] B01D *46/02*

U.S. Cl. 55—341 NT **12 Claims**



1. In a baghouse dust collector for top inlet operation, including an upper horizontal tubesheet with a plurality of openings for entry of dust-laden gases into pervious filter bags associated with the openings and arranged in groups or gangs, and hopper means below the lower ends of the filter bags for collecting dust, the improvement comprising,

an inflow thimble for each filter bag, including a generally bell-mouthed opening at an upper end, free of sharp breaks or angles, for smooth inflow of gases, with a large-radius outwardly-flaring peripheral flange larger in diameter than the tubesheet opening associated with the filter bag, for support by the tubesheet with the thimble extending down through the opening,

gasket means for substantially sealing the thimble with the tubesheet against leakage of unfiltered gases,

top end connection means associated with a filter bag and with the thimble for releasably securing the filter bag by its top end to the thimble, with the bag positioned over the exterior of the lower end of the thimble,

a gas inflow plenum above the upper tubesheet having sufficient depth to provide headroom for an operator,

a lower tubesheet with openings corresponding to and below the upper tubesheet openings, the lower openings leading to the hopper means,

the tubesheet openings of both the upper tubesheet and the lower tubesheet being spaced apart sufficiently for a person to walk on the lower tubesheet between groups of the filter bags and to have access to the bottom ends of the filter bags,

bottom end connection means associated with the lower tubesheet for releasably connecting the bottom end of the

filter bag to the lower tubesheet at an opening, by operations conducted entirely above the lower tubesheet, and including bottom end sealing means for substantially sealing against leakage of unfiltered gases, and

tensioning means for applying tension to each filter bag at its lower end, from a position above the lower tubesheet,

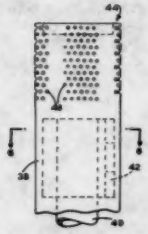
whereby, once the upper end of a filter bag has been connected via the thimble to the upper tubesheet, an operator may go onto the lower tubesheet and connect the bottom end of the filter bag via the bottom end connection means to the lower tubesheet.

4,648,890

COMBINATION DOWNFLOW-UPFLOW VAPOR-LIQUID SEPARATOR

John H. Kidwell, Uniontown; William P. Prueter, and Andrew M. Eaton, both of Alliance, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Feb. 27, 1985, Ser. No. 706,380
Int. Cl.[4] B01D *45/12*
U.S. Cl. 55—347 **2 Claims**



1. A vapor-liquid separator device comprising: a vertically disposed riser serving as a conduit for vertical flow of a two-phase mixture, open at its lower end to admit the mixture and closed at its upper end, the riser being formed of upper and lower sections interconnected by a frusto-conical section, the lower section having a diameter less than that of the upper section, a first plurality of curved arms radially disposed around the riser at its upper portion and extending into the riser to receive the mixture flowing therethrough, a second and third plurality of curved arms located immediately below the first plurality, the arms being mutually contiguous, a cylindrical member concentric to and outwardly radially spaced from the riser, forming an annulus therewith to receive the mixture from the curved arms, the upper portion of the cylindrical member extending above the curved arms and having a multiplicity of perforations for radial discharge of a portion of the separated liquid, means for discharge of the separated liquid at its lower end, means for discharge of the separated vapor at its upper end, and a retaining lip, one end of which is attached to the top of the cylindrical member and extending radially inward, the other end of which has a vertically extending annular plate.

4,648,891

OPTICAL FIBER

Koichi Abe, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Apr. 8, 1985, Ser. No. 721,104
Claims priority, application Canada, Sep. 17, 1984, 463378
Int. Cl.[4] C03B *37/018, 37/027*
U.S. Cl. 65—3.12 **7 Claims**

1. A method of making an optical waveguide comprising:

making a porous pure silica cylindrical rod preform by depositing particulate silica onto a support body;

cooling and then removing the preform rod from the support body;

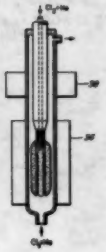
making a porous pure silica hollow cylindrical preform by depositing particulate silica onto a second support body;

cooling the hollow cylindrical preform; and removing the support body;

drying the preforms;

heating the hollow cylindrical preform in a fluorine-containing atmosphere to cause diffusion of fluorine thereinto;

putting the cylindrical rod preform into the hollow cylindrical preform;



heating the preforms to cause consolidation of the porous silica and to cause collapse of the hollow preform onto the rod preform to form a composite preform;

heating the composite preform locally to a drawing temperature; and

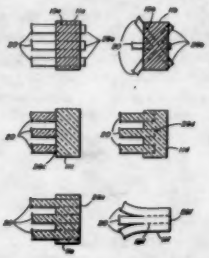
drawing an optical waveguide from the composite preform, such waveguide having a core part comprising silica derived from the rod preform and a cladding part comprising fluorine doped silica derived from the hollow preform.

4,648,892

METHOD FOR MAKING OPTICAL SHIELD FOR A LASER CATHETER

Carter Kittrell, Cambridge; Gary B. Hayes, Leominster, and Michael S. Feld, Waban, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 22, 1985, Ser. No. 715,219
Int. Cl.[4] C03B *37/025*
U.S. Cl. 65—4.21 **5 Claims**



1. A method of making an optical shield for a laser catheter wherein pieces of light transparent material are bonded together comprising the steps of:

(a) forming a rod from one piece of said material, said rod having an outer diameter;

(b) polishing one end of the rod;

(c) forming a tube having an inner diameter about equal to the outer diameter of the rod;

(d) inserting the polished end of the rod into the tube;

(e) bonding the rod and tube at the juncture of each to join the two together;

(f) removing any excess rod not inserted in the tube; and

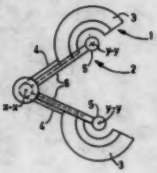
(g) polishing the portion of the tube and rod at the exposed removed end.

4,648,893

PROCESS AND APPARATUS FOR LUBRICATING GLASS MOLD CASTINGS

Michel Roux, Marnes-La-Coquette, France, assignor to L'Air Liquide, Paris, France

Filed Sep. 6, 1985, Ser. No. 773,325
Claims priority, application France, Sep. 18, 1984, 84 14266
Int. Cl.[4] C03B *39/00*
U.S. Cl. 65—26 13 Claims



1. A process for lubricating a split-mold mold casting, the split mold comprising two half-molds each defining a half-casting and having an end, the process comprising, in combination:

moving said half-molds apart to an open position;

forming a jet of gas at a stationary location beyond said end of each respective half-mold when said half-molds are in their open positions, and directing said jet of gas toward the respective open half-mold along an axis just about parallel to the corresponding half-casting; and

heating the jets of gas to form a powdery carbonaceous lubricating material.

10. In glass bottle producing apparatus of the type having at least one split rough-forming mold including two half-molds each having a longitudinal axis and an end, a finishing mold, and means for transferring rough forms from the rough-forming mold to the finishing mold, a lubricating device for the rough-forming mold which comprises, in combination:

means for moving the half-molds of the rough forming mold apart to an open position;

means including a pair of head members respectively mounted at fixed locations adjacent each open half-mold of the rough forming mold and beyond said end thereof and in a position for directing a jet of gas toward said open half-mold along an axis just about coincident with the longitudinal axis of the half-mold; and

means for igniting the jets of gas to form a powdery carbonaceous carbonated lubricating material.

4,648,894

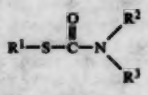
HERBICIDE COMPOSITIONS OF EXTENDED SOIL LIFE

Reed A. Gray, Saratoga, Calif., and Daniel L. Hyzak, Austin, Tex., assignors to Stauffer Chemical Co., Westport, Conn.

Continuation-in-part of Ser. No. 496,781, May 20, 1983, abandoned, which is a continuation of Ser. No. 358,979, Mar. 17, 1982, abandoned, which is a continuation of Ser. No. 163,617, Jun. 27, 1980, abandoned. This application Sep. 12, 1984, Ser. No. 649,779
Int. Cl.[4] A01N *25/22*
U.S. Cl. 71—87 16 Claims

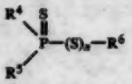
1. An herbicidal composition comprising

(a) an herbicidally effective amount of a thiolcarbamate having the formula



in which R^1, R^2, and R^3 are independently C_2–C_4 alkyl with the proviso that wherein R^1 is ethyl and R^2 is propyl, R^3 is other than propyl; and

(b) an amount of an organophosphorus compound sufficient to extend the soil life of said thiolcarbamate, said organophosphorus compound having the formula



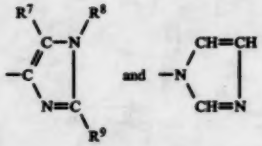
in which

R^4 is selected from the group consisting of C_1–C_4 alkyl and C_1–C_4 alkoxy,

R^5 is selected from the group consisting of C_1–C_4 alkoxy and C_1–C_4 alkylthio,

n is zero or one, and

R^6 is selected from the group consisting of



in which R^7 is phenyl, and R^8 and R^9 are C_1–C_4 alkyl.

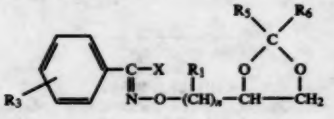
4,648,895

OXIME ETHERS, THE PREPARATION THEREOF, COMPOSITIONS CONTAINING THEM AND USE THEREOF

Henry Martin, Allschwil, and Urs Fricker, Gelterkinden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 481,683, Apr. 4, 1983, abandoned. This application Feb. 8, 1985, Ser. No. 699,488
Claims priority, application Switzerland, Apr. 16, 1982, 2326/82
The portion of the term of this patent subsequent to Sep. 23, 2002, has been disclaimed.
Int. Cl.[4] A01N *43/00*; C07D *317/00*
U.S. Cl. 71—88 13 Claims

1. A compound of the formula:



wherein

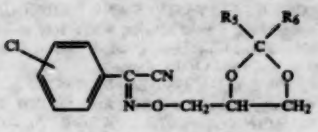
R_1 is hydrogen or alkyl of 1 to 4 carbon atoms;

each of R_5 and R_6, independently of the other, is hydrogen, alkyl of 1 to 4 carbon atoms, or haloalkyl of 1 to 4 carbon atoms, or R_5 and R_6 together are alkylene or alkenylene of 2 to 6 carbon atoms;

X is cyano or trifluoromethyl; and

n is 1 or 2.

2. A compound of the formula:



wherein

R_5 and R_6 independently are hydrogen, methyl, or isopropyl.

10. A composition for the selective control of weeds in cultures of crop-plants, which contains as active component

(a) a herbicidal haloacetanilide or a herbicidal thiocarbamate, and

(b) a compound according to claim 2 as antidote, together with a suitable carrier.

13. A method of protecting cultivated plants from damage that may be caused by the application of herbicides, which method comprises

(a) treating the locus of the plant before or during application of the herbicide, or

(b) treating the seeds or seedlings of the plant itself with an effective amount of a compound according to claim 2.

4,648,896

2-ARYL-4,6-DIHALOPYRIMIDINES AS ANTIDOTE FOR PROTECTING CULTIVATED PLANTS FROM PHYTOTOXIC DAMAGE CAUSED BY HERBICIDES

Hans-Georg Brunner, Lausen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 7, 1983, Ser. No. 549,038

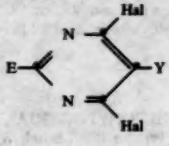
Claims priority, application Switzerland, Nov. 15, 1982, 6650/82

The portion of the term of this patent subsequent to Jan. 15, 2002, has been disclaimed.

Int. Cl.[4] A01N *43/54*; C07D *239/30, 239/34, 239/42*

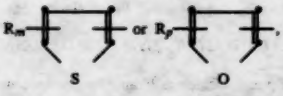
U.S. Cl. 71—90 25 Claims

1. A 2-aryl-4,6-dihalopyrimidine of the formula



wherein

E is a group



each Hal independently of the other is halogen,

Y is a group: —NR^1R^2, OR^3, —$N{=}CR^4R^5$, —$N{=}CH{-}NR^6R^7$,

R is halogen, nitro, —OR^8, —NR^9R^{10}, —$CO{-}R^{11}$, —$COOR^{11}$, —$CO{-}NR^9R^{10}$, —$O{-}CO{-}N(R^{11}){-}OR^{11}$, a C_1–C_6alkyl or C_3–C_6-cycloalkyl group each unsubstituted or substituted by halogen, or it is a C_2–C_6-alkeynl or C_2–C_6-alkynyl group

m and p are zero or a number from one to two,

R^1, R^2 and R^3 independently of one another are each hydrogen, —SO_2—C_1–C_6-alkyl, —SO_2—C_1—C_6-haloalkyl, —COR^4, or C_1–C_6-alkyl or C_3–C_6-alkenyl, except that R^3 may not be hydrogen,

R^4 and R^5 independently of one another are hydrgen, C_3–C_6-alkynyl, or C_1–C_6-alkyl or C_3–C_6-alkenyl each substituted or substituted by halogen or C_1–C_4-alkoxy,

R^6 and R^7 independently of one another are each C_1–C_6-alkyl which is unsubstituted or substituted by halogen,

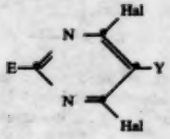
R^8 is hydrogen, C_1–C_6-alkylcarbonyl, C_3–C_6-alkenylcarbonyl, C_3–C_6-alkynylcarbonyl, or a C_1–C_6-alkyl C_3–C_6-alkenyl or C_3–C_6-alkynyl group each unsubstituted or substituted by halogen, hydroxyl, C_1–C_4-alkoxy or —NR^9R^{10},

R^9 and R^{10} independently of one another are each hydrogen, C_3–C_6-alkenyl, C_3–C_6-alkynyl, C_3–C_6-cycloalkyl or C_1–C_6-alkyl

R^{11} is hydrogen or a C_1–C_6-alkyl, C_3–C_6-alkynyl group, and halogen, as used herein, is selected from fluorine, chlorine, and bromine.

2. A composition for protecting cultivated plants against herbicides which composition contains as active ingredient an effective amount of a 2-aryl-4,6-dihalopyrimidine of claim 1, together with inert carriers and additives.

9. A 2-aryl-4,6-dihalopyrimidine of the formula



wherein

E is

each Hal independently of the other is halogen,

Y is a group: —NR^1R^2, OR^3, —$N{=}CR^4R^5$, —$N{=}CH{-}NR^6R^7$,

R is halogen, nitro, —OR^8, —NR^9R^{10}, —$CO{-}R^{11}$, —$COOR^{11}$, —$CO{-}NR^9R^{10}$, —$O{-}CO{-}N(R^{11}){-}OR^{11}$, a C_1–C_6alkyl or C_3–C_6-cycloalkyl group each unsubstituted or substituted by halogen, or it is a C_2–C_6-alkenyl or C_2–C_6-alkynyl group,

n is zero or a number from one to three,

R^1, R^2 and R^3 independently of one another are each hydrogen, —SO_2—C_1–C_6-alkyl, —SO_2—C_1–C_6-haloalkyl, —COR^4, or C_1–C_6-alkyl or C_3–C_6-alkenyl, except that R^3 may not be hydrogen,

R^4 and R^5 independently of one another are hydrogen, C_3–C_6-alkynyl, or C_1–C_6-alkyl or C_3–C_6-alkenyl each unsubstituted or substituted by halogen or C_1–C_4-alkoxy,

R^6 and R^7 independently of one another are each C_1–C_6-alkyl which is unsubstituted or substituted by halogen,

R^8 is hydrogen, C_1–C_6-alkylcarbonyl, C_3–C_6-alkenylcarbonyl, C_3–C_6-alkynylcarbonyl, or a C_1–C_6-alkyl C_3–C_6-alkenyl or C_3–C_6-alkynyl group each unsubstituted or substituted by halogen, hydroxy, C_1–C_4-alkoxy or —NR^9R^{10},

R^9 and R^{10} independently of one another are each hydrogen, C_3–C_6-alkenyl, C_3–C_6-alkynyl, C_3–C_6-cycloalkyl or C_1–C_6-alkyl, R^{11} is hydrogen or a C_1–C_6-alkyl, C_3–C_6-alkenyl or C_3–C_6-alkynyl group, and

halogen, as used herein, is selected from fluorine, chlorine, and bromine.

19. A composition for protecting cultivated plants against herbicides, which composition contains, as an activeingredient, an effective amount of a 2-aryl-4,6-dihalopyrimidine according to claim 9 together with inert carriers and additives.

4,648,897

HERBICIDAL N-OXADIAZOLYLMETHYL-, N-THIADIAZOLYLMETHYL-, AND N-TRIAZOLYLMETHYL-SUBSTITUTED ALPHA-HALOACETANILIDE

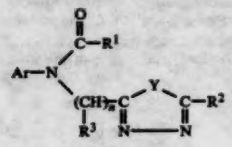
David C. K. Chan, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 904,955, May 11, 1978, Pat. No. 4,243,408. This application Jul. 21, 1980, Ser. No. 170,482

Int. Cl.[4] C07D 249/08, 271/10, 285/12; A01N 43/82

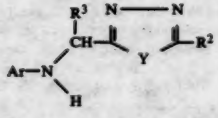
U.S. Cl. 71—90 27 Claims

1. A compound of the formula



wherein Ar is 2,6-disubstituted phenyl substituted with the same or different substituents selected from fluoro, chloro, bromo, iodo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or haloalkyl of 1 to 4 carbon atoms and 1 to 3 of the same or different halogens selected from fluoro, chloro, bromo or iodo, R^1 is halomethyl of 1 to 3 of the same or different halogens selected from fluoro, chloro, bromo, or iodo, R^2 is hydrogen; alkyl of 1 to 6 carbon atoms; alkenyl of 2 to 6 carbon atoms; alkynyl of 2 to 6 carbon atoms; cycloalkyl of 3 to 6 carbon atoms; or haloalkyl of 1 to 4 carbon atoms and 1 to 3 of the same or different halogens selected from fluoro, chloro, bromo or iodo; alkoxy of 1 to 6 carbon atoms; alkylthio of 1 to 6 carbon atoms; alkenylthio of 2 to 6 carbon atoms; alkynylthio of 2 to 6 carbon atoms; phenyl; phenyl substituted with 1 to 3 of the same or different substituents selected from fluoro, chloro, bromo, iodo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or haloalkyl of 1 to 4 carbon atoms and of 1 to 3 of the same or different halogens selected from fluoro, chloro, bromo or iodo; or NR^5R^6 wherein R^5 and R^6 individually are hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms or alkynyl of 2 to 6 carbon atoms, R^3 is hydrogen or alkyl of 1 to 6 carbon atoms, n is 1 or 2, and Y is O or S.

14. A compound having the formula:



wherein

Ar is phenyl substituted with 1 to 3 of the same or different substituents selected from fluoro, chloro, bromo, or alkyl of 1 to 3 carbon atoms;

R^2 is hydrogen; alkyl of 1 to 6 carbon atoms; or haloalkyl of 1 to 4 carbon atoms and 1 to 3 of the same or different halogens selected from fluoro, chloro, bromo or iodo;

R^3 is hydrogen or alkyl of 1 to 6 carbon atoms; and

Y is O, or NR wherein R is hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms or alkynyl of 2 to 6 carbon atoms.

4,648,898

TRIAZINE DERIVATIVES AND HERBICIDES

Yoshio Hayase, Mie; Koichi Morita; Kinya Ide, both of Shiga, and Toshio Takahashi, Hyogo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

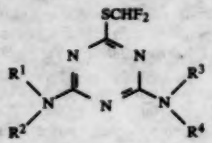
Filed Aug. 9, 1985, Ser. No. 764,252

Claims priority, application Japan, Aug. 15, 1984, 59-170131

Int. Cl.[4] A01N 43/70; C07D 251/52, 401/04, 403/04

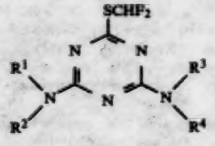
U.S. Cl. 71—93 23 Claims

1. A compound of the formula:



wherein R^1, R^2, R^3, and R^4 each is hydrogen, aliphatic hydrocarbon residue selected from the group consisting of C_1–C_{10} alkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl and C_3–C_7 cycloalkyl, lower alkoxy-(lower alkyl), cyano-(lower alkyl), or C_6–C_{12} aryl-(lower alkyl); or (R^1 and R^2) or (R^3 and R^4) taken together form lower alkylene or acid addition salts thereof.

18. A herbicidal composition comprising: an effective amount of at least one compound of the formula:



wherein R^1, R^2, R^3, and R^4 each is hydrogen, aliphatic hydrocarbon residue selected from the group consisting of C_1–C_{10} alkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl and C_3–C_7 cycloalkyl, lower alkoxy-(lower alkyl), cyano-(lower alkyl), or C_6–C_{12} aryl-(lower alkyl); or (R^1 and R^2) or (R^3 and R^4) taken together form lower alkylene or acid addition salts thereof and one or more carriers.

4,648,899

N-PHENYLSULFONYL-N'-TRIAZINYLUREAS

Karl Gass, Magden; Werner Föry, Basel; Willy Meyer, Riehen, and Werner Töpfl, Dornach, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

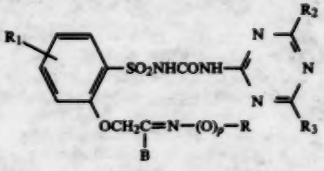
Division of Ser. No. 458,799, Jan. 18, 1983. This application Apr. 23, 1986, Ser. No. 855,060

Claims priority, application Switzerland, Jan. 25, 1982, 437/82

Int. Cl.[4] C07D 251/46, 251/52, 251/42; A01N 43/70

U.S. Cl. 71—93 9 Claims

1. A compound selected from the group consisting of a sulfonylurea of the formula:



wherein

R_1 is hydrogen, halo, nitro, alkyl of 1 to 4 carbon atoms, haloalkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon

atoms, alkenyl of 2 to 5 carbon atoms, or alkoxycarbonyl of 1 to 4 carbon atoms in the alkoxy group;

R_2 is alkyl or alkoxy, each of 1 to 3 carbon atoms, unsubstituted or substituted with 1 to 3 halogen atoms;

R_3 is halo, hydrogen, unsubstituted alkyl of 1 to 3 carbon atoms, alkyl of 1 to 3 carbon atoms substituted with alkoxy of 1 to 4 carbon atoms or with 1 to 3 halogen atoms, unsubstituted alkoxy of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms substituted with methoxy, ethoxy or 1 to 3 halogen atoms, or —NR_4R_5 in which R_4 is hydrogen or methyl and R_5 is hydrogen, methyl, ethyl or methoxy;

p is 0 or 1;

B is alkyl of 1 to 3 carbon atoms; and

R is alkyl of 1 to 3 carbon atoms, alkenyl of 3 to 5 carbon atoms or, if p is 1, hydrogen; and

the alkali metal, alkaline earth metal, and organic amine salts thereof.

8. A herbicidal and growth-regulating composition comprising an effective amount of a compound according to claim 1 and a carrier therefor.

4,648,900

SUCTION SINTERING METHOD AND APPARATUS THEREFOR

Olle Bostrom, Slottsvagen 83, S-183 52 Taby, and Karl Gorling, Kullavagen 23, S-181 62 Lidingo, both of Sweden

PCT No. PCT/SE81/00354, § 371 Date Aug. 4, 1982, § 102(e) Date Aug. 4, 1982, PCT Pub. No. WO82/02062, PCT Pub. Date Jun. 24, 1982

Continuation of Ser. No. 406,235, Aug. 4, 1982, abandoned. This PCT application Dec. 4, 1981, Ser. No. 639,621

Claims priority, application Sweden, Dec. 8, 1980, 8008613

Int. Cl.[4] C22B *1/00*

U.S. Cl. 75—3 **6 Claims**

1. A method for producing a moist suction-sinter charge of high permeability and stable structure on a mobile suction-sintering grate or in a stationary or mobile suction-sintering pan, which comprises the steps of:

(a) adjusting the water content of a moist particulate material mixture to be suction sintered so that a minimum of fuel is consumed to maintain the temperatures required for sintering said particulate material mixture;

(b) compacting said particulate material mixture to form a coherent moist porous cake having a thickness of between about 4 mm to 12 mm, the compaction pressure being adjusted in such a manner that the water present in said mixture will fill the pore volume of said cake to 60–90%, said particulate material being held together mainly by capillary forces; and

(c) breaking said cake into pieces having a dimension of 20 mm or less to form said suction-sinter charge.

4,648,901

INTRODUCING ONE OR MORE METALS INTO A MELT COMPRISING ALUMINUM

Peter Murray, and David Slinn, both of Rotherham, England, assignors to Shieldalloy Corporation, Newfield, N.J.

Division of Ser. No. 452,112, Dec. 22, 1982, Pat. No. 4,564,393. This application Jul. 17, 1985, Ser. No. 756,047

Claims priority, application United Kingdom, Dec. 23, 1981, 8138667

Int. Cl.[4] C22B *21/06*

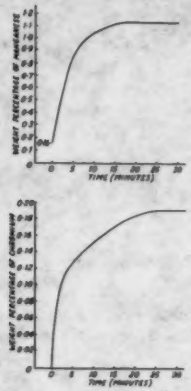
U.S. Cl. 75—68 R **41 Claims**

1. A method of introducing at least one additive metallic material into a melt comprising aluminum which (comprises) comprises introducing into the said melt an additive composition (comprising) consisting of as essential ingredients an intimate admixture containing the following components:

(a) a metallic aluminum-comprising powder;

(b) a powder of at least one additive metallic material to be introduced into the said melt selected from the group consisting of metallic manganese, chromium, tungsten, molybdenum, titanium, vanadium, iron, cobalt, copper, niobium, tantalum, zirconium, hafnium, silver and alloys thereof; and

(c) a flux component (comprising at least one fluxing material) selected from the group consisting of (alkali metal-



containing halide fluxes, alkali metal-containing carbonate fluxes,) potassium aluminum fluoride (potassium cryolite), potassium chloride, potassium fluoride, sodium chloride, sodium fluoride, sodium carbonate, and admixtures thereof.

4,648,902

REINFORCED METAL SUBSTRATE

Robert D. Giglia, Rye, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 531,364, Sep. 9, 1983, abandoned. This application Oct. 21, 1983, Ser. No. 544,306

Int. Cl.[4] C22C *1/04, 1/08, 5/06, 33/02*

U.S. Cl. 75—229 **13 Claims**

1. A process for the production of a reinforced metal substrate which comprises

(a) forming a slurry of a mixture of metal coated carbon fibers, fibrillated binder fibers and metal powder, the ratio of metal coated carbon fibers to metal powder ranging from about 95:5-5:95, respectively, the metal powder and the metal on the carbon fibers being identical,

(b) laying the fibrous mixture down from said slurry as a random non-woven web,

(c) drying the laid-down web, and

(d) sintering the resultant dried web.

6. A web comprising a dry, sintered sheet of a mixture of metal coated carbon fibers and metal powder, the ratio of metal coated carbon fibers to metal powder ranging from about 95:5 to 5:95, respectively, said web being the product of the process of claim 1.

4,648,903

IRON BASE SINTERED, WEAR-RESISTANT MATERIALS AND METHOD FOR PRODUCING THE SAME

Yutaka Ikenoue; Hiroyuki Endoh, both of Chiba; Kei Ishii, Kanagawa, and Keitaro Suzuki, Chiba, all of Japan, assignors to Hitachi Powdered Metals Co., Ltd., Chiba, Japan

Filed Feb. 28, 1985, Ser. No. 705,628

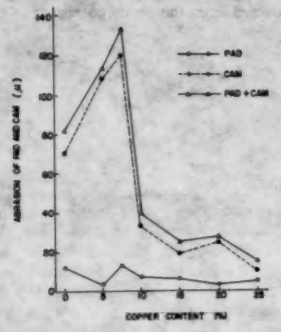
Claims priority, application Japan, Apr. 10, 1984, 59-70129

Int. Cl.[4] C22C *38/16*

U.S. Cl. 75—230 **6 Claims**

1. A iron base sintered, wear-resistant powder compact,

consisting essentially of: 10–25% of Cu, 3–25% of Cr, 0.1–2% of P, 0.5–3% of C, 1–13% of at least two elements selected



from the group consisting of 0.5–7% Mo, 0.1–8% W, 0.1–3% V and 0.5–2% Ni, and the balance being essentially Fe.

4,648,904

AQUEOUS SYSTEMS CONTAINING SILANES FOR RENDERING MASONRY SURFACES WATER REPELLANT

Ralph J. DePasquale, and Michael E. Wilson, both of Jacksonville, Fla., assignors to SCM Corporation, New York, N.Y.

Filed Feb. 14, 1986, Ser. No. 829,530
Int. Cl.[4] C09D *5/20*
U.S. Cl. 106—2 **15 Claims**

1. An aqueous silane emulsion composition useful to render a porous ceramic material water repellant which consists essentially of (a) from 1% to 40% by weight of hydrolyzable silane having a molecular weight up to about 500 and the general formula:

$$R_n—Si—(R')_{4-n}$$

wherein R is a C_1–C_{20} hydrocarbyl or halogenated hydrocarbyl group, R′ is C_1–C_3 alkoxy or halide or amino or carboxyl group, and n is 1 or 2, or oligomers thereof, (b) from 0.5 to 50% by weight of the silane component of an emulsifier having an HLB value of from 4–15, and (c) water.

4,648,905

AQUEOUS PRINTING INK

Michael C. Peck, Stone Mountain, and Dennis M. Jacobi, Savannah, both of Ga., assignors to Union Camp Corporation, Wayne, N.J.

Continuation-in-part of Ser. No. 462,705, Jan. 31, 1983, abandoned. This application Feb. 27, 1985, Ser. No. 706,102
Int. Cl.[4] C09D *11/04, 11/08, 11/10*
U.S. Cl. 106—24 **20 Claims**

1. A printing ink vehicle, which comprises:
(a) a binder consisting essentially of a sulfated or sulfonated organic water dispersible pigment binder;
(b) from 1 to 10 percent by weight of the vehicle nonvolatile portion of a viscosity adjusting agent;
(c) a defoaming portion of a defoamer;
(d) sufficient of a pH adjusting agent to obtain a pH of 5–12; and
(e) water;
wherein the binder comprises 50 to 100 percent of total vehicle solids said vehicle having a viscosity range of from about 150 to about 25,000 centipoise (Brookfield viscosity at 25° C.) and a pH within the range of 5–12.

4,648,906

HIGH STRENGTH DENTAL IMPRESSION COMPOSITION

Don D. Porteous, Los Angeles, and Orman Valle, Culver City, both of Calif., assignors to Van R Dental Products, Inc., Los Angeles, Calif.

Filed May 20, 1986, Ser. No. 865,114
Int. Cl.[4] C09K *3/00*
U.S. Cl. 106—35 **16 Claims**

1. High gel strength, high tensile strength dental impression composition consisting essentially of a reversible hydrocolloid gel forming base, and an aqueous reagent in an amount sufficient to form a reversible gel with said base, said reagent comprising from 50 to 95% by weight water and the balance a water soluble glycol, and zinc borate in an amount above about 0.001 part per 100 parts by weight of the composition.

4,648,907

HIGH COLOR STRENGTH DIARYLIDE YELLOW PIGMENT COMPOSITIONS

Byron G. Hays, Verona, and Robert J. Stanaback, Gladstone, both of N.J., assignors to BASF Corporation, Clifton, N.J.

Filed Apr. 12, 1985, Ser. No. 722,976
Int. Cl.[4] C09D *11/08*
U.S. Cl. 106—30 **6 Claims**

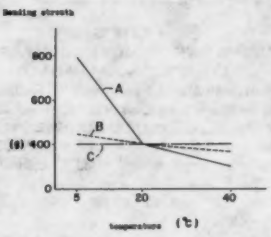
1. A method of manufacturing diarylide yellow pigments comprising tetrazotizing 3,3′-dichlorobenzidine, then coupling the tetrazonium salt with an acetoacetarylide, and then filtering and washing the resulting pigment, wherein the improvement comprises:
modifying the tetrazotized 3,3′-dichlorobenzidine by reacting with about 3 mole % to about 5 mole % of an acetic acid solution of a first acetoacetarylide; and
then coupling the modified 3,3′-dichlorobenzidine tetrazonium salt into a slurry of a second acetoacetarylide, thereby producing diarylide yellow pigment compositions having increased color strength over diarylide yellow compositions produced by conventional methods.

4,648,908

COATED PIGMENT AND COSMETIC MATERIALS COMPRISING THE SAME

Yutaka Takasuka, Kamakura; Kunihiko Mohri, Shizuoka, and Akiko Kawaguchi, Shimizu, all of Japan, assignors to Pola Chemical Industries Inc., Japan

Filed Jul. 19, 1984, Ser. No. 632,334
Claims priority, application Japan, Feb. 28, 1984, 59-36985
Int. Cl.[4] C04B *14/00*; C09C *1/00*; A61K *7/035*
U.S. Cl. 106—308 F **11 Claims**



1. A coated pigment composition readily dispersed in water comprising at least one coated pigment and at least 20% by weight of said composition of of water; said pigment selected from the group consisting of titanium dioxide-coated mica, colored titanium dioxide-coated mica and colored bismuth oxychloride, coated on the surfaces thereof with a water-repellent coating of a metallic soap of the formula $(RCCO)_nM$, wherein R is selected from straight chain, branched chain,

saturated and unsaturated aliphatic hydrocarbon groups having more than 6 carbon atoms, M is selected from aluminum and zinc, and n is the valency of the metal, said surface coating being prepared by reacting in an aqueous medium an alkaline salt of an aliphatic acid radical $(RCOO)^-$ with a mineral acid metal salt where said metal is M as defined above in a theoretical equivalent ratio of 1:4 to 1:10 and said pigments, the ratio by weight of said pigment to said so-formed soap being in the ratio of 1:0.01 to 1:0.1.

4,648,909

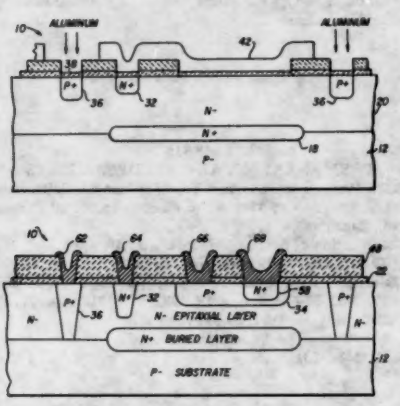
FABRICATION PROCESS EMPLOYING SPECIAL MASKS FOR THE MANUFACTURE OF HIGH SPEED BIPOLAR ANALOG INTEGRATED CIRCUITS

Surinder Krishna, Fremont, and Kulwant Egan, Santa Jose, both of Calif., assignors to Fairchild Semiconductor Corporation, Cupertino, Calif.

Filed Nov. 28, 1984, Ser. No. 675,497

Int. Cl.⁴ H01L *27/04, 27/02*

U.S. Cl. 148—1.5 **24 Claims**



1. A method of fabricating a bipolar transistor in a wafer having a silicon substrate of first conductivity type, an epitaxial layer of second conductivity type and a buried layer of second conductivity type disposed between a portion of the substrate and the epitaxial layer, the method comprising:

forming a first mask over the epitaxial layer having openings therein to define a collector contact, a base, and an isolation region;

in a desired sequence performing the steps of:

covering at least one, but not all, of the openings for the collector contact, the base, and the isolation region with a protective layer,

introducing desired conductivity type impurity into the epitaxial layer through whichever opening is not covered with the protective layer,

repeating the above steps of covering and introducing until desired conductivity type impurity has been introduced into the epitaxial layer through all of the openings, the desired conductivity type being first conductivity type for the isolation and base regions and second conductivity type for the collector contact region;

forming a second mask over the epitaxial layer having an opening therein to define an emitter region situated within the base region and openings therein for ohmic connections to each of the base region, the collector contact and the isolation region;

covering at least the openings for ohmic connections to the base region and isolation region;

introducing second conductivity type impurity into the epitaxial layer through at least the emitter opening; and

forming electrical connections to all of the emitter region, the base region, the collector contact region and the isolation region through the openings in the second mask.

4,648,910

METHOD OF BONDING A HIGH TEMPERATURE RESISTANT POLYMERIC MATERIAL TO AN ALUMINUM BASE SUBSTRATE AND ARTICLE THEREFROM

Kenneth J. Adams, Novelty, and David E. Dyke, Shaker Heights, both of Ohio, assignors to Clevite Industries Inc., Glenview, Ill.

Continuation-in-part of Ser. No. 596,359, Apr. 3, 1984, Pat. No. 4,586,977. This application Aug. 21, 1985, Ser. No. 767,901

The portion of the term of this patent subsequent to May 6, 2003, has been disclaimed.

Int. Cl.⁴ C23C *22/67*

U.S. Cl. 148—6.2 **5 Claims**

1. An alkaline bath for use in producing a conversion coating on an aluminum base substrate to allow bonding of a high temperature resistant polymeric material to the aluminum base substrate consisting essentially of a dissolved alkali metal salt selected from the group consisting of sodium, potassium, cesium, rubidium, and mixtures thereof of chromic acid and an alkali metal carbonate, with the alkali metal being selected from the group consisting of sodium, potassium, cesium, rubidium, and mixtures thereof, in a ratio of said carbonate to said chromic salt from 3 to 1 up to 9 to 1 wherein the carbonate concentration is at least about 0.0625 mole/liter, and from about 0.0005 mole/liter up to its saturation point in the bath of a water soluble salt of an alkaline earth metal from the group consisting of calcium, barium, strontium and mixtures thereof.

4,648,911

SEALING PROCESS

Edgar Grüninger, Staad, Switzerland, assignor to FFA Flug-und Fahrzeugwerke AG, Switzerland

PCT No. PCT/CH83/00100, § 371 Date May 1, 1984, § 102(e) Date May 1, 1984, PCT Pub. No. WO84/00982, PCT Pub. Date Mar. 15, 1984

PCT Filed Sep. 1, 1983, Ser. No. 610,996

Claims priority, application Switzerland, Sep. 3, 1982, 5258/82

Int. Cl.⁴ C25D *11/24*

U.S. Cl. 148—6.27 **13 Claims**

1. A process for sealing the surface of anodically oxidized metals comprising contacting the anodized surface while the surface is still wet from the anodizing process at a temperature below 30° C. with an aqueous solution containing at least a first and second compound wherein said first compound is a nickel salt and said second compound is a fluoride and said nickel salt including its water of crystallization and said fluoride salt being present in approximate stoiciometrically equivalent amounts.

4,648,912

HIGH ENERGY BEAM THERMAL PROCESSING OF ALPHA ZIRCONIUM ALLOYS AND THE RESULTING ARTICLES

George P. Sabol, Murrysville; Samuel G. McDonald, Monroeville, and John I. Nurminen, Acme, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 343,788, Jan. 29, 1982, abandoned. This application Jan. 13, 1984, Ser. No. 571,123

Int. Cl.⁴ C22F *1/18*

U.S. Cl. 148—11.5 F **20 Claims**

1. A process for improving the high temperature steam corrosion resistance of an alpha zirconium alloy body having a random precipitate distribution comprising the steps of:

beta treating a first layer of said body, wherein said first layer is beneath and adjacent to a first surface of said

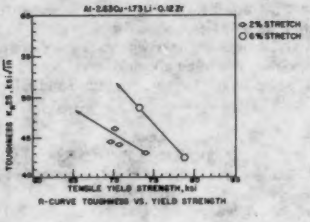
body, and wherein said beta treating produces two dimensional linear arrays of precipitates in said first layer;
while forming a second layer of alpha recrystallized grains beneath said first layer while maintaining said random precipitate distribution in said second layer;
then cold working said body;
then final annealing said body;
and wherein after said final anneal both said first layer and said second layer have said improved high temperature steam corrosion resistance as evidenced by an adherent substantially black continuous oxide film formed on both said first layer and said second layer upon 24 hours exposure of said first layer and said second layer to a 500° C., 1500 psi steam test.

4,648,913

ALUMINUM-LITHIUM ALLOYS AND METHOD

Warren H. Hunt, Jr., Monroeville; Ralph R. Sawtell, Pittsburgh, and Philip E. Bretz, Plum Boro, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 29, 1984, Ser. No. 594,344
Int. Cl.[4] C22F 1/04
U.S. Cl. 148—12.7 A **43 Claims**



R-CURVE TOUGHNESS VS. YIELD STRENGTH

1. In a method of making aluminum base alloy products having combinations of improved strength and fracture toughness in the aged condition, the method comprising the steps of:
(a) providing a lithium-containing aluminum base alloy product in a condition suitable for aging;
(b) imparting to said product, prior to an aging step, a working effect equivalent to stretching said product greater than about 4% at room temperature;
(c) selecting said alloy to be responsive to said working effect and controlling said working effect to provide improved combinations of fracture toughness and strength in response to aging; and
(d) subjecting said product to an aging step.

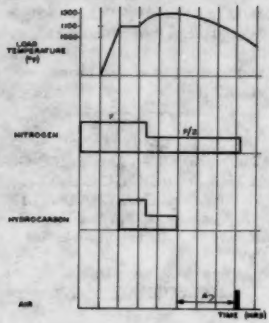
4,648,914

PROCESS FOR ANNEALING FERROUS WIRE

Mircea S. Stanescu, Pluckemin; David J. Weinstein, Livingston, and Cornelius W. Cornelssen, Edison, all of N.J., assignors to The BOC Group, Inc., Montvale, N.J.

Filed Oct. 19, 1984, Ser. No. 662,855
Int. Cl.[4] C21D 1/26
U.S. Cl. 148—16 **9 Claims**

1. A method of annealing ferrous wire bearing lubricants under a nitrogen based atmosphere in a furnace comprising the steps of heating said wire to a soaking temperature of about 1320° F., subsequently cooling said wire in said furnace; and introducing an oxygen containing gas into the furnace and into contact with said wire when the wire temperature has declined to about 1050°–950° F. such that oxygen is reacted with residual lubricants and soot deposits without significant decarburization of said wire.



4,648,915

PERMANENT MN-AL-C ALLOY MAGNETS

Akihiko Ibata, Izumisano, and Yoichi Sakamoto, Suita, both of Japan, assignors to Matsushita Electric Industrial Company, Ltd., Japan

Continuation of Ser. No. 486,242, Apr. 18, 1983, Pat. No. 4,579,607. This application Sep. 30, 1985, Ser. No. 784,661
Claims priority, application Japan, Apr. 19, 1982, 57-65908; Apr. 19, 1982, 57-65909; Apr. 19, 1982, 57-65910; Apr. 27, 1982, 57-72056; May 26, 1982, 57-89144
Int. Cl.[4] H01F 1/02
U.S. Cl. 148—101 **14 Claims**

1. A permanent magnet consisting essentially of a polycrystalline Mn-Al-C alloy having a compressed circumferential portion and a noncompressed portion and having been produced by providing a cylindrical billet of a polycrystalline Mn-Al-C alloy magnet which has been rendered anisotropic, and subjecting said cylindrical billet to compressive working on only a circumferential portion thereof in such a way that the compressive working is applied to said circumferential portion parallel to the axis thereof at a temperature of 530° to 830° C. until a compressive strain produced by the compressive working is at least 0.05 as expressed by the absolute value of logarithmic strain and said cylindrical billet is plastically deformed uniformly in the radial direction, the anisotropy of said compressed circumferential portion being radial wherein the only direction of easy magnetization of said compressed circumferential portion is parallel to the radial axis and the anisotropy of the noncompressed portion being different from that of said compressed portion and selected from the group consisting of tangential, uniaxial and plane anisotropy.

4,648,916
METHOD OF CONTROLLING COOLING OF HOT-ROLLED STEEL SHEET AND SYSTEM THEREFOR

Masahiko Morita, and Osamu Hashimoto, both of Kurashiki, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed May 6, 1985, Ser. No. 730,633
Claims priority, application Japan, Oct. 19, 1984, 59-219449
Int. Cl.[4] G01B *11/24*
U.S. Cl. 148—128 10 Claims

1. A method of controlling the cooling of a hot-rolled steel sheet after hot rolling, comprising:

determining a target value of a transformation rate required for obtaining mechanical properties ultimately expected from said hot-rolled steel sheet;

determining the fraction of gamma to alpha transformation of said hot-rolled steel sheet, in a section in which the cooling is controlled, by at least one transformed fraction detector;

measuring an elapsed time from the start of cooling;

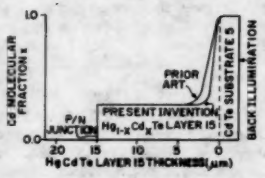
calculating the transformation rate of said steel sheet in the cooling stage from the gamma to alpha transformed fraction and the elapsed time; and

controlling the conditions of cooling so that the transformation rate in the cooling stage coincides with said target value.

4,648,917
NON ISOTHERMAL METHOD FOR EPITAXIALLY GROWING HGCDTE

Robert E. Kay, Newport Beach; Hakchill Chan, Corona del Mar; Fred Ju, Huntington Beach, and Burton A. Bray, Laguna Niguel, all of Calif., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Aug. 26, 1985, Ser. No. 769,909
Int. Cl.[4] H01L *21/363*
U.S. Cl. 148—175 10 Claims



1. A method for epitaxially growing a layer of HgCdTe on a CdTe substrate wherein a HgTe source is spaced from the CdTe substrate a distance of between 0.1 mm and 10 mm, and the CdTe and HgTe are heated within a temperature range of between 500° C. and 625° C. during a processing step having a duration of between 5 minutes and 4 hours, during at least 5 minutes of which the CdTe substrate is hotter than the HgTe source.

4,648,918
ABRASION RESISTANT ALUMINUM ALLOY

Kazuhiko Asano; Osamu Takezoe; Yoshinori Yasuda; Kenji Hayashi; Masanobu Aoki; Yoshio Doi, and Makoto Shimata, all of Yamaguchi, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

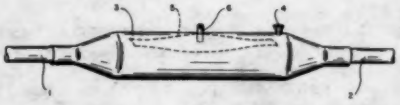
Filed Sep. 5, 1984, Ser. No. 647,397
Claims priority, application Japan, Mar. 2, 1984, 59-40145; Mar. 19, 1984, 59-53158; Mar. 26, 1984, 59-57588
Int. Cl.[4] C22C *21/02*
U.S. Cl. 148—439 19 Claims

1. An abrasion resistant aluminum alloy consisting of 7.5–15 wt. % of Si, 3.0–6.0 wt. % of Cu, 0.3–1.0 wt. % of Mg, 0.25–1.0% of Fe, 0.25–1.0 wt. % of Mn and 0.05–0.4 wt. % of Cr or 0.05–0.25 wt. % of Zr or a mixture of said Cr and said Zr, with the balance being Al and impurities, and having an alloy structure with a primary Si crystal size smaller than 80 microns, a Si-Mn-Fe compound grain size of smaller than 120 microns, and an α-Al phase size of smaller than 100 microns.

4,648,919
PROTECTION OF CABLE SPLICE

Stephen H. Diaz, Los Altos Hills, Calif.; Christian A. M. Debbaut, Cary; William H. Humphries, Raleigh, both of N.C.; Alvah A. Lawrence, Los Altos, Calif.; Glen W. Ragland, Dunwoody, Ga., and Gerald L. Shimirak, Raleigh, N.C., assignors to Raychem Corp., Menlo Park, Calif.

Continuation of Ser. No. 652,359, Sep. 18, 1984, abandoned. This application Aug. 15, 1985, Ser. No. 769,781
Int. Cl.[4] H01B *13/06*
U.S. Cl. 156—48 5 Claims



5. A method for protecting a splice connecting at least two multiconductor electrical cables from ingress of water which comprises:

(a) positioning a closure about the splice and sealing the closure to the cable jackets to form an enclosed area for the splice and the cable ends wherein the closure has an opening for introducing sealant into the enclosed area and a pressure means in the enclosed area for applying pressure to the liquid sealant;

(b) introducing a hardenable liquid sealant into the enclosed area thereby displacing the air from the enclosed area;

(c) closing the opening; and

(d) pressurizing the pressure means to a pressure sufficient to force the liquid sealant to penetrate into said splice and into the interstices between the conductor in the cables; and

(e) maintaining said pressure in the enclosed area for a period of time to permit the liquid sealant to harden.

4,648,920

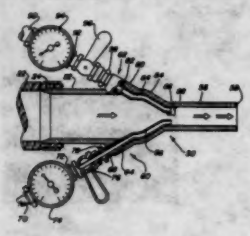
PROCESS FOR MANUFACTURING BATT-TYPE INSULATION FROM LOOSE FIBROUS PARTICLES

Henry Sperber, 8 Red Fox La., Englewood, Colo. 80111

Division of Ser. No. 621,846, Jun. 18, 1984, Pat. No. 4,530,468, which is a division of Ser. No. 265,258, May 19, 1981, Pat. No. 4,487,365. This application Jul. 16, 1985, Ser. No. 755,705

Int. Cl.⁴ B27N *3/02*

U.S. Cl. 156—62.2 **13 Claims**



1. A process for manufacturing batt type insulation from loose fibrous particles, the process including the steps of:

introducing a stream of carrier air and loose fiber insulation particles into a nozzle having a wetting portion and a reduced size exit portion;

passing said stream of carrier air and loose fiber insulation particles into said wetting portion;

simultaneously injecting an auxiliary stream of gas and a stream of liquid adhesive into said stream of carrier air and loose fiber insulation particles at said wetting portion so that portions of said auxiliary stream of gas are entrapped within said loose fiber insulation particles as said particles are wetted by said liquid adhesive;

said auxiliary stream of gas being injected into said wetting portion substantially in the direction of said reduced size exit portion so that the velocity of said stream of carrier air and loose fiber insulation particles is increased; and

depositing the flow of adhesive wetted fiber insulation particles onto the surface of a desired area to produce a built-up layer of adhesive wetted fibers which when set will form a batt insulation material.

4,648,921

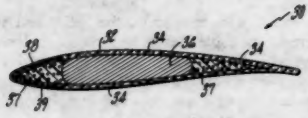
METHOD OF MAKING FIBER REINFORCED ARTICLES

Harry A. Nutter, Jr., Longmeadow, Mass., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 193,519, Oct. 2, 1980, abandoned. This application Dec. 10, 1982, Ser. No. 448,167

Int. Cl.⁴ B29C *43/04, 43/18*

U.S. Cl. 156—77 **11 Claims**



1. A method for manufacturing an airfoil, comprising the steps of:

coating the external surface of a spar with a curable bonding adhesive;

transferably coating the interior surface of a first mold with a curable bonding adhesive;

disposing said coated spar in said mold, said mold interior surface being spaced from at least a portion of said coated spar to define a void region;

introducing a curable lightweight filler material into said mold void region;

precuring said curable bonding adhesives and lightweight filler material within said mold thereby to form an airfoil subassembly having the filler material adhesively bonded to the spar and including an adhesive coating on the outer surface thereof;

enveloping substantially the entire airfoil subassembly within a covering of fibrous reinforcing material impregnated with a synthetic polymeric material and constrained within a second mold to a desired shape; and

curing said synthetic polymeric material which impregnates said reinforcing material covering within said second mold to thereby produce an airfoil of said desired shape.

4,648,922

PROCESS FOR THE PREPARATION OF PHENOLIC FOAM

Gerald C. Marks, Cardiff, Wales, and Per I. Quist, Astorp, Sweden, assignors to BP Chemicals Limited, London, England

Filed Feb. 20, 1985, Ser. No. 703,296

Claims priority, application United Kingdom, Feb. 24, 1984, 8404860

Int. Cl.⁴ B32B *31/06*

U.S. Cl. 156—79 **6 Claims**

1. A process for the production of laminates in which a phenolic foam forming mixture is dispensed between a moving upper facing and a moving lower facing, said facings moving at similar speeds, the mixture being allowed to partially foam and cure therebetween such that the mixture rises to its final thickness in a conveyor press so as to complete the foaming, curing and setting of the mixture thereby foaming a laminate with the foam sandwiched between the facings, characterised in that prior to the mixture having risen to 80% of its final thickness a pressure is applied to the foaming mixture through the upper facing by a member which is sufficiently flexible to allow continual rise of the foam, said pressure being sufficient to reduce substantially the formation of voids and craters immediately below the upper facing,

wherein the flexible member is made of metal, wherein said upper facing is selected from the group consisting of lacquered aluminium and glass fibre mat,

wherein said lower facing is selected from the group consisting of lacquered aluminium and glass fibre mat, and

further comprising heating said flexible member to a temperature between 90° C. and 130° C., so that the adhesive strength between the facings and the foam therebetween in the resultant laminate increases with increasing flexible member temperature.

4,648,923

METHOD OF FORMING A SHOE INSERT

Bernard Chapnick, 3 Pasture Rd., Beverly, Mass. 01915

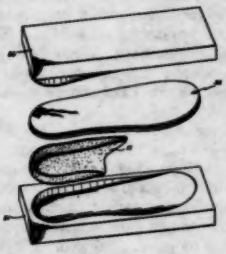
Division of Ser. No. 566,186, Dec. 28, 1983, Pat. No. 4,586,273. This application Feb. 1, 1985, Ser. No. 697,474

Int. Cl.⁴ A43B *10/00, 13/41*

U.S. Cl. 156—82 **6 Claims**

1. A method of making a shoe insert comprising the steps of; providing a foam layer, providing a fabric layer, heating the foam layer, joining the foam and fabric layers, providing a base layer of a density on the same order of magnitude as the density of the foam layer, heating one of said base layer and foam

layer, joining the base layer with the foam layer to form a trilaminate, providing a pre-formed heel member of a density substantially greater than the density of the foam layer and formed of a compressed foam material to obtain greater density and thus greater rigidity in comparison to that of the foam layer, applying adhesive between the heel member and the trilaminate, said adhesive being heat and pressure reactivata-



ble, and molding under pressure, said heel member and trilaminate so as to cause shaping, of the trilaminate into the heel member and forming into an integral one-piece shoe insert with the pre-formed heel member forming the bottom surface of the finished shoe insert at the heel area thereof, and the base layer forming the bottom surface of the finished shoe insert at the forward area thereof.

4,648,924

BRANCH-OFF METHOD

Jean-Marie E. Nolf, Hammemille, Belgium, assignor to N.V. Raychem S.A., Kessel-lo, Belgium

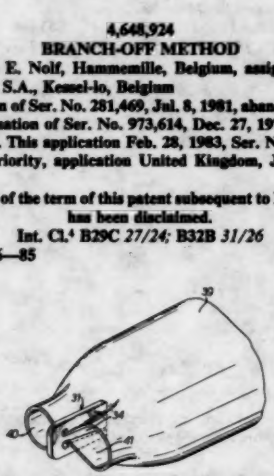
Continuation of Ser. No. 281,469, Jul. 8, 1981, abandoned, which is a continuation of Ser. No. 973,614, Dec. 27, 1978, Pat. No. 4,298,415. This application Feb. 28, 1983, Ser. No. 470,710

Claims priority, application United Kingdom, Jan. 9, 1978, 631/78

The portion of the term of this patent subsequent to Nov. 3, 1998, has been disclaimed.

Int. Cl.[4] B29C *27/24;* B32B *31/26*

U.S. Cl. 156—85 **77 Claims**



1. A method of forming a branch-off seal between a heat-shrinkable sleeve and at least two substrates, which comprises the steps of:

(a) positioning the substrates within the heat-shrinkable sleeve;

(b) forming at least two heat-shrinkable terminal conduits by positioning a clip having at least two elongate legs over the outer surface of the heat-shrinkable sleeve at an open end thereof, wherein at least two of said legs are positioned externally of the sleeve and the substrates are within the terminal conduits; and

(c) while the clip remains on the outer surface of the heat-shrinkable sleeve, applying heat so as to effect shrinkage of the sleeve and to form the desired seal.

4,648,925

METHOD OF MAKING TRANSPARENT POLARIZING LAMINATED GLASSES

Serge P. P. Goepfert, Samoreau; Serge A. M. Renault, Montigny/Loing, and Francoise M. M. Roger, Avon, all of France, assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 29, 1985, Ser. No. 717,829

Claims priority, application France, Aug. 1, 1984, 84 12192

Int. Cl.[4] B32B *31/00;* C09J *5/02*

U.S. Cl. 156—153 **6 Claims**

1. A process for fabricating a transparent polarizing laminated glass comprising an inorganic or organic substrate, a coating of polarizing properties deposited upon one surface of the substrate, and a one piece, optically transparent composite film consisting, on the one hand, of a layer of thermoplastic polyurethane with adhesive properties and, on the other hand, of a layer of thermosetting polyurethane with anti-lacerative and self-regenerative properties, the thermoplastic polyurethane layer adhering to the coating with polarizing properties, this process comprehending the following steps:

(a) forming parallel microgrooves on the inorganic or organic glass substrate that is to receive the polarizing coating by means of a very slightly abrasive brushing of said substrate;

(b) carefully washing the substrate surface that is to receive the polarizing coating and drying this surface;

(c) depositing on the washed and dried surface of the substrate a mixture of three organic colorants corresponding to the three primary colors and having a nematic state;

(d) treating the resulting polarizing coating by immersing into an aqueous solution of inorganic salts at an acid pH in order to reduce the water solubility of said polarizing coating;

(e) contacting the resulting product at a temperature not to exceed 30° C. with an aqueous solution prepared from at least one compound selected from the group of γ-aminopropyltrimethoxysilane and γ-aminopropyltriethoxysilane, the silane representing 0.1–10% by volume of the solution and the aqueous solution having a pH ranging between 10–11.2;

(f) rinsing the resulting product to eliminate excess silane;

(g) heat treating the rinsed product at about 80°–140° C. for about 15–60 minutes; and

(h) applying the composite polyurethane film by first subjecting it to conditions of moderate temperature and pressure in order to insure a crease-free and gradual spreading out and adherence of the film to the polarizing coating, and thereafter to conditions of elevated temperature and pressure to reinforce the mechanical bond between the film and the coating and to achieve crosslinking of the composite film.

4,648,926

ELECTRICALLY-ISOLATING COUPLER SUITABLE FOR HIGH PRESSURE CRYOGENIC GAS FLOW

Oakley G. Ross, Upland; Mark L. Kline, Fullerton, and Larry D. Wedertz, Mira Loma, all of Calif., assignors to General Dynamics Pomona Division, Pomona, Calif.

Division of Ser. No. 600,070, Apr. 13, 1984, Pat. No. 4,601,493. This application Nov. 8, 1985, Ser. No. 796,258

Int. Cl.[4] F16L *25/02;* C03C *27/02*

U.S. Cl. 156—158 **8 Claims**

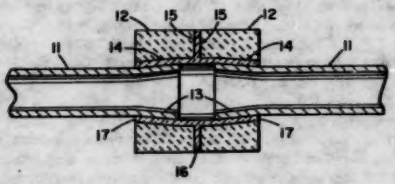
1. A method of nonconductively interconnecting two conductive pieces of tubing, which comprises:

drilling a separate tapered hole through each of two dielectric wafers with the larger end of the tapered hole extending to a corresponding face on the wafers;

spreading a bonding agent on the wafers, both on the faces and within the tapered holes;

inserting an end of each piece of tubing through a separate one of the tapered holes to extend out of the larger end, including divergently flaring and positioning the tubing

end recessed from the corresponding face with the flare of the tubing end paralleling the taper of the hole; and



bonding the wafer faces together with the larger ends of the tapered holes aligned and the flared tubing ends sealed in fluid communication with an electrically-nonconductive gap between them.

4,648,927

METHOD AND DEVICE FOR PRODUCTION OF COVER STRIPS FOR INSERTION INTO THE GROOVES OF STATORS OF ELECTRIC MACHINES

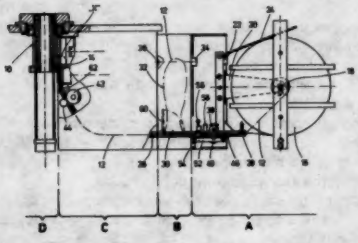
Hans Droll, Nordring 76, 6000 Frankfurt 60, and Dieter Fessler, Kiefernweg 1, 6380 Bad Homburg, both of Fed. Rep. of Germany

Filed Jun. 7, 1985, Ser. No. 742,704

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1984, 3421428

Int. Cl.[4] B65H *19/14, 19/20, 69/06*

U.S. Cl. 156—159 **11 Claims**



1. In a method for producing cover strips to be inserted into grooves of stators of electric machines, wherein the strips are provided as strip material on a delivery roll and delivered from a delivery roll through a main guide channel by means of feed members to a cutting tool where the strip material is cut into strips, the improvement comprising:

providing strip material on a plurality of delivery rolls, the strip material from each delivery roll passing through a feed passage associated therewith which receives the strip material delivered from that roll,

supplying strip material from a first one of said delivery rolls through its respective feed passage to the main guide channel,

and subsequently switching to deliver strip material to the main guide channel from a second delivery roll instead of from the first delivery roll,

said switching comprising effecting relative movement between said main guide channel on the one hand and said feed passages on the other hand, to effect non-alignment of the feed passage of the first delivery roll from the main guide channel and to align the feed passage of the second delivery roll with the main guide channel,

withdrawing a trailing end of the strip material from the first delivery roll out of the upstream end of the main guide channel before delivering the strip material of the second delivery roll to the main guide channel, and then delivering the strip material from the second delivery roll through its respective feed passage and into the main guide channel.

11. The apparatus for producing cover strips to be inserted into grooves of stators of electric machines, comprising:

a plurality of delivery rolls, each providing a supply of strip material, each delivery roll having a feed passage associated therewith for delivering strip material from its respective delivery roll, a main guide channel for receiving strip material individually from each of said feed passages and for delivering the strip material to a cutting tool,

and means for positioning each of said feed passages separately into alignment with said main guide channel by effecting relative movement between the main guide channel on the one hand and said feed passages on the other hand,

said main guide channel having a side opening closable by a controllable flap, a chamber adjacent said side opening positioned to form a loop of said strip material, a first strip material drive means in at least that feed passage in alignment with the main guide channel and a further drive means downstream from said side opening adjacent the said cutting tool, said further drive means having means for driving the strip material forwardly or in reverse, and said further drive means also having a neutral non-drive position.

4,648,928

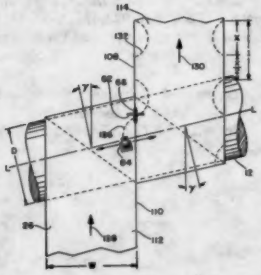
METHOD AND APPARATUS FOR APPLYING DISCRETE STRIPS OF MATERIAL TO A LONGITUDINALLY EXTENDING WEB

Thomas M. Ales, Winnebago County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Feb. 27, 1986, Ser. No. 833,688

Int. Cl.[4] B32B *31/08, 31/18;* **A61F** *13/16*

U.S. Cl. 156—164 **20 Claims**



1. A method of applying discrete strips of material to both longitudinally opposite segments of a longitudinally extending web, comprising:

longitudinally moving the web along a travel path including a helically looped portion having a center axis and passing opposite longitudinal edges of the web in lapping proximity to one another in a lapping zone of said looped portion;

applying at least one continuous strip of material to the web by transversely oscillating the strip across the opposite longitudinal edges in the lapping zone of the travel path; and

severing the applied strip between said edges in the lapping zone.

16. Apparatus for forming discrete strips of material on both longitudinally opposite segments of a longitudinally extending web, comprising:

web transport means for longitudinally moving the web along a travel path including a helically looped portion having a center axis to pass opposite longitudinal edges of

the web in lapping proximity to one another in a lapping zone of the looped portion;

strip applicator means for applying at least one continuous strip of material to the web by transversely oscillating the strip across said opposite longitudinal edges in the lapping zone of the travel path; and

severing means for severing the applied continuous strip between said edges in the lapping zone.

4,648,929

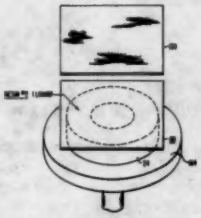
MAGNETIC CORE AND METHODS OF CONSOLIDATING SAME

Jaime E. Siman, Watkinsville, Ga., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 7, 1985, Ser. No. 699,378

Int. Cl.[4] B65H *81/02*

U.S. Cl. 156—188 **15 Claims**



1. A method of consolidating a magnetic core containing amorphous metal, without applying significant mechanical stresses thereto, comprising the steps of:

forming a magnetic core having a plurality of lamination layers defining closely adjacent edges on opposite sides of the magnetic core,

applying a reinforced, adhesive insulative structure to the adjacent edges of the magnetic core without penetration therebetween,

bonding said adhesive structure to said adjacent edges,

and bonding an outer structure to said insulative inner structure to provide a conformal composite coating,

said step of applying an adhesive insulative structure to the closely adjacent edges of the magnetic core including the step of providing a first radiation gellable liquid resin which cures with a minimum amount of residual stress to the lamination layers, and said step of bonding an outer structure to said inner insulative structure including the step of providing a second gellable liquid resin, with said first liquid resin providing a lower stress bond when gelled than said second liquid resin, and with said second liquid resin having a higher tensile strength when gelled than said first liquid resin, such that the higher strength outer structure of the composite coating cooperates with the lower stress inner structure to protect and maintain the desired core configuration during thermal cycling, while the inner structure forms a low stress interface between the outer structure and the magnetic core, such that the composite coating simultaneously supports and protects the magnetic core against mechanical stresses.

4,648,930

METHOD OF SEPARATING LABELS FROM A CARRIER STRIP

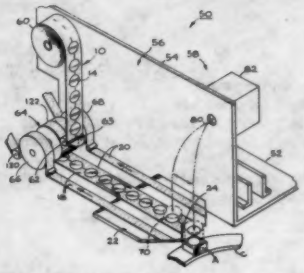
Herbert La Mers, Ventura Labeling System, 2317 Palma Dr., Ventura, Calif. 93003

Division of Ser. No. 591,462, Mar. 20, 1984, Pat. No. 4,547,252, which is a division of Ser. No. 357,921, Mar. 15, 1982, Pat. No. 4,454,180, which is a continuation of Ser. No. 134,626, Mar. 27, 1980, abandoned, which is a division of Ser. No. 866,455, Jan. 3, 1978, Pat. No. 4,217,164. This application Jun. 11, 1985, Ser. No. 743,688

The portion of the term of this patent subsequent to Aug. 12, 1997, has been disclaimed.

Int. Cl.[4] B65C *9/18*

U.S. Cl. 156—247 **3 Claims**



1. A method of automatically separating labels from an elongated carrier strip having sprocket holes uniformly spaced therealong and including first and second abutting parallel carrier strip portions carrying labels bridging and adhesively attached to both of said carrier strip portions, said method comprising the steps of:

mounting said carrier strip for movement along a path substantially contiguous with a planar surface having a substantially V-shaped recess including first and second edges;

pulling each of said first and second carrier strip portions at a substantially first linear rate from a position down-path from said first and second edges to move said strip portions around said edges in diverging directions to successively separate each label from said carrier strip portions;

feeding said first and second carrier strip portions from a position up-path from said first and second edges in a manner tending to reduce their rate of movement to less than said first linear rate to thus create and maintain tension in said carrier strip portions; and wherein

said step of pulling and/or said step of feeding includes cooperating with said uniformly spaced sprocket holes either down-path or up-path from said first and second edges to control the movement of said carrier strip to prevent any cumulative differential linear movement between said first and second carrier strip portions.

4,648,931

METHOD OF FORMING BEAD SEAL IN BIAXIALLY ORIENTED POLYMER FILM BY HEAT BONDING

Orin B. Johnston, 16480 N. Hillcrest Ct., Eden Prairie, Minn. 55344

Division of Ser. No. 561,684, Dec. 15, 1983, Pat. No. 4,531,997. This application May 13, 1985, Ser. No. 733,702

Int. Cl.[4] B32B *31/18, 31/20*

U.S. Cl. 156—251 **4 Claims**

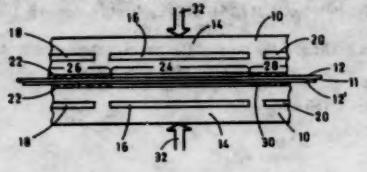
1. The method of forming a hermetic bead seal between adjacent layers of biaxially oriented plastic film in a selected segment of a web comprising

pressing said layers in said segment together in a sealing zone,

pressing an adjacent segment of said layers together in an unheated zone,

heating the layers in said sealing zone to above bonding temperature of said plastic while so pressed,

continuing to press said last named layers together while



allowing them to shrink back to their pre-oriented molecular configuration,

simultaneously restraining the layers of said adjacent segment in said unheated zone against movement while maintaining their temperature below said bonding temperature, and

cooling said heated layers sufficiently quickly to avoid degradation of the plastic.

4,648,932

HIGH-ANGULARITY RETROREFLECTIVE SHEETING AND METHOD FOR MANUFACTURE

Terry R. Bailey, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 483,604, Apr. 11, 1983, Pat. No. 4,505,967. This application Jan. 14, 1985, Ser. No. 691,054

The portion of the term of this patent subsequent to Mar. 19, 2002, has been disclaimed.

Int. Cl.[4] G02B *5/128*; B32B *3/00*

U.S. Cl. 156—276 **5 Claims**

1. A method for making retroreflective sheeting comprising forming first and second transparent polymeric layers; embedding a monolayer of microspheres in the first layer under heat and pressure to a depth of on the average less than one-half their diameter but more than one-tenth their diameter; laminating the second layer in substantially full contact with the microsphere-covered surface of the first layer so that the first layer is in direct contact with, and follows the curved surfaces of, the portions of the microspheres protruding from the first layer, and also is in direct contact with the portions of the first layer between the microspheres, the laminating force being applied under heat and pressure using a cushioning web that comprises a polymeric material which engages the second polymeric layer and which is softened during the lamination operation; and coating the exposed configured surface of the second layer with a specularly reflective layer.

4,648,933

APPARATUS FOR APPLYING STAMPS TO PACKAGES ARRAYED IN CARTONS

Lewis R. Graziano, New York, N.Y., assignor to American Bank Note Company, New York, N.Y.

Filed Sep. 30, 1985, Ser. No. 782,137

Int. Cl.[4] B65C *5/04, 9/02, 9/18, 9/36*

U.S. Cl. 156—361 **11 Claims**

1. Apparatus for affixing a stamp having its back coated with adhesive to each of a plurality of packages aligned in a row in an upwardly open carton, comprising:

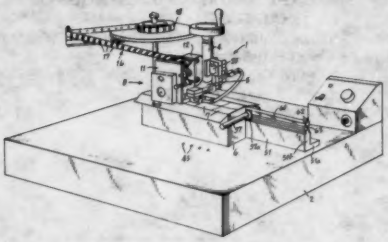
(a) presser means, movable between an upper inactive position and a lower active position, for pressing a stamp against an upwardly facing surface of a package in a carton as aforesaid;

(b) means, providing a stationary carton support surface spaced below the active position of said presser means, for supporting an upwardly open carton containing a plurality of packages aligned in a row as aforesaid to be stamped while enabling the carton to be advanced longitudinally across the support surface along a rectilinear path such that the upwardly facing surfaces of the packages in the last-mentioned row are brought successively into register with the active position of the presser means;

(c) means for feeding stamps, one at a time, to a position adjacent the active position of said presser means for application by said presser means to an upwardly facing package surface in register with said active position;

(d) means for guiding the carton along said path to bring the upwardly facing surfaces of the packages in the last-mentioned row successively into register with the active position of the presser means, said guiding means comprising a stationary guide member extending parallel to said path for engaging a side surface of the carton as the carton advances in said path;

(e) cam means supported by the guide member for sliding



movement therealong parallel to said path and having a portioin projecting into said path to engage the leading end of the carton as the carton advances in the path such that the cam means moves with the carton along the guide member toward the presser means active position;

(f) switch means engageable by and operated by the cam means, said cam means being coordinated with locations of packages in the carton for operatively engaging the switch means, during advance of the carton in the path, each time a package in the last-mentioned row is advanced into register with the presser means active position; and

(d) means operated by the switch means, each time the switch means is operatively engaged by the cam means, to move the presser means from inactive to active position for pressing the adjacent stamp against the upwardly facing surface of a package in register with said active position whereby the stamp is affixed to the package, and thereafter to restore the presser means to its inactive position while activating the feeding means to feed another stamp to a position adjacent the presser means active position.

4,648,934

APPARATUS FOR THREE-DIMENSIONAL MOLDINGS

Günter H. Kiss, Wildenowstrasse 20, D-1000 Berlin 45, Fed. Rep. of Germany

Filed May 7, 1984, Ser. No. *607,427*

Claims priority, application Fed. Rep. of Germany, May 26, 1983, 3319391

Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—443 **13 Claims**

1. In an apparatus for molding three-dimensional moldings from flat materials in which the flat material is molded between closeable and openable, opposed press molds in a softened state, the improvement comprising:

an auxiliary device movable backward and forward between the open press molds, the auxiliary device comprising a

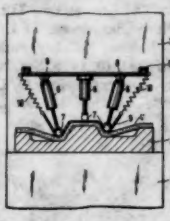
frame structure, a push rod, and a ram head attached to the push rod;

the frame structure movable backward and forward between the open press molds;

at least one push-rod pivotally mounted at a first end on the frame structure, a second free end of the push-rod opposed to the first end being extensible into contact with the surface of the material to be molded to press such material into one of the press molds; and

wherein the movement direction of the push-rod forms an angle with the direction of movement of press molds.

11. In an apparatus for molding three-dimensional moldings from flat materials in which the flat material is fed in a given direction and is molded between closeable and openable, opposed press molds in a softened state, the improvement comprising:



an auxiliary device movable backward and forward between the open press molds, the auxiliary device comprising a frame structure, a push-rod and a ram head attached to the push-rod;

at least one push-rod pivotally mounted at a first end on the frame structure, a second free end of the push-rod opposed to the first end being extensible into contact with the surface of the material to be molded to press such material into one of the press molds; wherein at least one arm is pivotally connected to the auxiliary movable device in a direction of the intended flow of the material so that the point of contact between the ram head and the surface of the material to be molded is displaced in the feed direction of the material relative to a center of the pivoting movement of suspension of the ram to the auxiliary movable device.

4,648,935

TAPE APPLYING APPARATUS

Robert L. Brown, Akron, and Sargeant E. Aylies, North Canton, both of Ohio, assignors to GenCorp Inc., Akron, Ohio

Filed Dec. 24, 1984, Ser. No. 685,820

Int. Cl.⁴ B32B *35/00*

U.S. Cl. 156—577 **5 Claims**

1. Apparatus for applying tape to a sheet of flexible material including a frame, a let-off spindle rotatably mounted on the frame for holding a roll of tape, and an applicator roll mounted on an applicator axle that is rotatably mounted on the housing for receiving tape from the let-off spindle and rolling the tape onto the flexible material, wherein the improvement comprises:

(a) a support roll mounted on a support axle that is rotatably mounted on the housing and positioned to roll over the flexible material, said support roll being positioned closer to the center of gravity of the apparatus than said applicator roll; and

(b) means connected between the support roll and the applicator roll for driving the applicator roll at a peripheral speed faster than the peripheral speed of the support roll and including

(1) a drive pulley fixed to the support roll and an applicator pulley fixed to the applicator roll, the drive pulley having a diameter larger than the applicator pulley,

(2) an endless applicator drive belt connecting the applicator and drive pulleys, and

(3) means for tensioning the applicator drive belt between the pulleys.

4,648,936

DOPANT TYPE AND/OR CONCENTRATION SELECTIVE DRY PHOTOCHEMICAL ETCHING OF SEMICONDUCTOR MATERIALS

Carol I. H. Ashby, Edgewood, and James L. Dishman, Albuquerque, both of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 11, 1985, Ser. No. 786,563

The portion of the term of this patent subsequent to Mar. 10, 2004, has been disclaimed.

Int. Cl.⁴ H01L *21/306*

U.S. Cl. 156—643 **22 Claims**

1. A method of selectively photochemically dry etching a first semiconductor material of a given composition in the presence of a second semiconductor material which is of a composition different from said first material, said second material substantially not being etched during said method, comprising

subjecting both materials to the same photon flux of an energy greater than their respective direct bandgaps and to the same gaseous chemical etchant under conditions where said etchant would be ineffective for chemical etching of either material were the photons not present,

said conditions also being such that the resultant electronic structure of the first semiconductor material under said photon flux is sufficient for the first material to undergo substantial photochemical etching under said conditions and being such that the resultant electronic structure of the second semiconductor material under said photon flux is not sufficient for the second material to undergo substantial photochemical etching under said conditions.

4,648,937

METHOD OF PREVENTING ASYMMETRIC ETCHING OF LINES IN SUB-MICROMETER RANGE SIDEWALL IMAGES TRANSFER

Seiki Ogura, Hopewell Junction; Jacob Riseman, Poughkeepsie; Nivo Rovedo, Poughquag, and Ronald N. Schulz, Salt Point, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1985, Ser. No. 792,931

Int. Cl.⁴ B44C *1/22*

U.S. Cl. 156—643 **18 Claims**

1. A method of forming a sub-micrometer dimensional mask structure on a semiconductor substrate comprising:

forming an insulative layer on a major surface of said substrate;

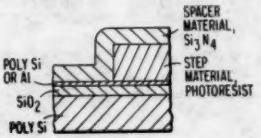
forming a stop layer on said insulative layer;

forming a step material layer at selected areas on said stop layer;

covering said insulative layer and said step material with a spacer material;

removing by selective etching, portions of said spacer material to define a vertical spacer at locations where said mask structure is to be present, said selective etching being positively stopped by said stop layer;

removing by selective etching exposed portions of said stop layer to define a pattern of spacers without any etching of the insulative layer;



removing said insulative layer to define a pattern of spacers on said major surface of said substrate having a tiered structure of spacer material, stop material and insulative material; and

removing said spacer material and the remaining stop material under said spacer material to leave a sub-micrometer dimensional mask structure of remaining insulative material.

4,648,938

COMPOSITION/BANDGAP SELECTIVE DRY PHOTOCHEMICAL ETCHING OF SEMICONDUCTOR MATERIALS

Carol I. H. Ashby, Edgewood, and James L. Dishman, Albuquerque, both of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 11, 1985, Ser. No. 786,560
Int. Cl.[4] H01L *21/306*
U.S. Cl. 156—643 **15 Claims**

1. A method of selectively photochemically dry etching a first semiconductor material of a given composition and direct bandgap Eg_1 in the presence of a second semiconductor material of a different composition and direct bandgap Eg_2, wherein $Eg_2 > Eg_1$, said second semiconductor material substantially not being etched during said method, comprising

subjecting both materials to the same photon flux and to the same gaseous etchant under conditions where said etchant would be ineffective for chemical etching of either material were the photons not present,

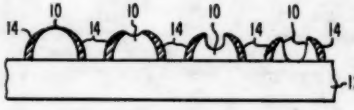
said photons being of an energy greater than Eg_1 but less than Eg_2, whereby said first semiconductor material is photochemically etched and said second material is substantially not etched.

4,648,939

FORMATION OF SUBMICROMETER LINES

Jer-shen Maa, Middlesex County, Plainsboro Township, and Sheng M. Huang, Mercer County, Lawrenceville Township, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 28, 1986, Ser. No. 845,585
Int. Cl.[4] B44C *1/22*; H01L *21/306*; C23F *1/02*; C03C *15/00*
U.S. Cl. 156—643 **6 Claims**



1. A process of forming a submicrometer structure of a first material on a substrate comprising:

forming an elongated structure of the first material on the substrate, said structure having a width of about one micrometer or greater, opposed sides and a rounded surface between said sides, wherein the radius of curvature of the surface of the structure is from about 100 to 500 nanometers, and the angle of taper of the sides of the structure to the substrate is from about 70° to about 90°;

forming on said structure a layer of a second material which etches at a slower rate than said first material, said layer at least partially covering the sides of said structure; and

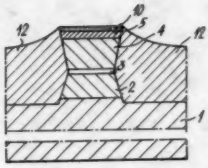
anisotropically etching said structure for a time sufficient to form two parallel elongated structures having exposed substrate between them.

4,648,940

PROCESS FOR MANUFACTURING A SEMICONDUCTOR LASER HAVING A BURIED RIBBON

Louis Menigaux, 85 Avenue des Tilleius, 91440 Bures sur Yvette, and Pierre Sansonetti, 61 Chemin de la Vallée aux Coups, 92290 Chatenay Malabry, both of France

Filed Dec. 10, 1985, Ser. No. 806,802
Claims priority, application France, Dec. 11, 1984, 84 18900
Int. Cl.[4] H01L *21/306, 21/205, 21/22*; B44C *1/22*
U.S. Cl. 156—649 **3 Claims**



1. Process for manufacturing a semiconductor laser having a buried ribbon, in which:

on a substrate (1), there is deposited by epitaxy a first N-doped confinement layer (2), a non-doped active layer (3), a second P-doped confinement layer (4) and a contact layer (5), the group of these layers forming a double heterostructure,

by photolithography, a ribbon (7) is delimited on this double heterostructure and an etching on both sides of the ribbon is performed, to the substrate, which allows a mesa to remain on the substrate,

a resumption of epitaxy is performed on both sides of the mesa on the parts of the substrate (2) which have been released to cause a semiconductive layer (12) to grow to achieve an optical and electrical confinement of the laser,

this process being characterized by the fact that before the photolithography operation, an implantation of a p-type doping material is performed in the entire contact layer (5), which has the effect of rendering the upper surface of the contact layer (5) amorphous, then the process is continued by delimiting the ribbon, etching and resumption of epitaxy.

4,648,941

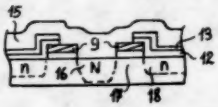
PROCESS FOR FORMING TWO MOS STRUCTURES WITH DIFFERENT JUXTAPOSED DIELECTRICS AND DIFFERENT DOPINGS

Pierre Blanchard, Echirolles, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 5, 1986, Ser. No. 826,120
Claims priority, application France, Feb. 19, 1985, 85 02366
Int. Cl.[4] B44C *1/22*
U.S. Cl. 156—657 **6 Claims**

1. A process for forming two MOS structures with different juxtaposed dielectrics and different dopings on a semiconductor substrate, for isolating in different ways the regions of the substrate where the channel is situated on the surface and those where the channel is situated in the mass comprising the steps

of forming on a surface of the substrate a first silicon oxide layer then a second silicon nitride layer above the first layer, etching the second silicon nitride layer by photolithography so as to form a first window and define the isolating regions, causing a thick isolating oxide self-aligned with the double oxide and nitride layer to grow inside the window, replacing the double silicon oxide and nitride layer by a third silicon oxide layer forming the first dielectric, depositing a fourth layer of a material formed by doped silicon, etching in the fourth layer a second window for defining a channel region in the mass by means of the mask thus formed, baring the surface



of the substrate defined by the second window and by the thick oxide, doping the substrate through the second window, oxidizing then depositing a double silicon dioxide and silicon nitride layer above the doped silicon layer and the bared portion of the sustrate, removing the double silicon dioxide and silicon nitride layer above the fourth doped silicon layer which served as mask for obtaining the second window, and depositing a fifth silicon layer above the fourth doped silicon layer and the remaining double silicon dioxide and silicon nitride layer covering the second window and etching the fifth doped silicon layer as well as the silicon layer for forming a gate.

4,648,942

PAPER MACHINE

Wilhelm Wanke, and Ludwig Hauser, both of Heidenheim, Fed. Rep. of Germany, assignors to J.M. Voith GmbH, Fed. Rep. of Germany

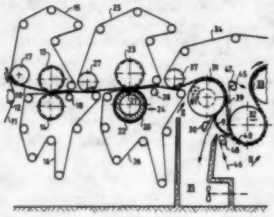
PCT No. PCT/EP84/00233, § 371 Date Apr. 1, 1985, § 102(e) Date Apr. 1, 1985, PCT Pub. No. WO85/00841, PCT Pub. Date Feb. 28, 1985

PCT Filed Aug. 3, 1984, Ser. No. 719,280

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1983, 3328162

Int. Cl.[4] D21F *7/00, 5/04*

U.S. Cl. 162—286 **14 Claims**



1. Paper machine with a press section and a drying section and with the following characteristics:

(a) The press section is free of any press roll touching the paper web, that is, there are exclusively double felt roll presses used through which proceeds the paper web (10) which is to be dehydrated, between two felt belts (15/16; 25/26);

(b) in the area following the press section, of the drying cylinders (31, 32 33) of the drying section, the paper web (10) is carried constantly by a backing belt (34);

(c) the orbital path of the backing belt (34) is tangent to the orbital path of one of the felt belts (26; 26*a*; 26*b*) of the press section, in a way such that it transfers the paper web (10) without any open draw from the press section to the drying section;

(d) the first drying cylinder (31) following the press section is located outside the endless loop of the backing belt (34), with the paper web (10) proceeding with the backing belt (34) across the upper cylinder area of this drying cylinder (31); characterized in that

(e) a rope carrier (45,46) located outside the paper web width (p) and serving the threading of a paper marginal strip (9) into the drying section is so arranged that the entrance point (40) of the marginal strip (9) into the rope carrier is located behind the leaving point (39) of the paper web (10) from the first drying cylinder (31).

2. Paper machine according to claim 1, characterized in that the entrance point (40) of the rope carrier (45,46) is arranged in the lower area of the second drying roller (32) of the drying section located inside the backing belt loop.

4,648,943

VIBRATING FORMING SHOE IN A TWIN WIRE FORMER

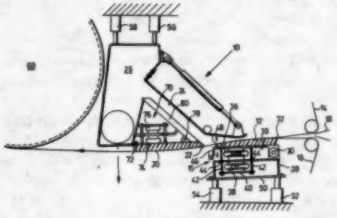
Alexander Malashenko, Quebec, and Norman A. Stock, Beaconsfield, both of Canada, assignors to Valmet-Dominion Inc., Lachine, Canada

Filed Apr. 30, 1985, Ser. No. 729,047

Claims priority, application Canada, May 18, 1984, 454686

Int. Cl.[4] D21F *1/36, 1/18*

U.S. Cl. 162—300 **8 Claims**



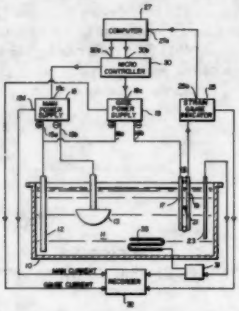
1. A twin wire former for forming a paper web from an aqueous stock of papermaking fibers comprising: a first travelling, tensioned, looped forming wire having a substantially horizontal run, a second travelling, tensioned, looped forming wire having a co-operating substantially horizontal run co-operating with said horizontal run of said first wire to form a sandwich of said first and second wires with said stock sandwiched therebetween, a forming shoe within the loop of said first forming wire, said forming shoe having a convex surface bearing against said first forming wire along a portion of said substantially horizontal run, means to mount said forming shoe, said means to mount including means for pressing said shoe against said first forming wire to deform said sandwich around said convex surface and force said first wire into substantial conformity with said convex surface and squeeze water from said stock through said second forming wire, said means for pressing including a first resilient means urging said convex surface against said sandwich and including a second resilient means counteracting said first resilient means, said second resilient means being adjustable to adjust the spring constant of said means for mounting said shoe, and means to vibrate said shoe with an amplitude and frequency such that travel of said first wire over said convex surface of said shoe is facilitated.

4,648,944

APPARATUS AND METHOD FOR CONTROLLING PLATING INDUCED STRESS IN ELECTROFORMING AND ELECTROPLATING PROCESSES

Ronald W. George, Windermere; James G. Ohmart, Orlando; Kurt H. Iriesberger, Longwood; Lawrence L. Michaud, Casselberry, and Darell E. Engelhaupt, St. Cloud, all of Fla., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Jul. 18, 1985, Ser. No. 756,214
Int. Cl.[4] G01N *27/42*
U.S. Cl. 204—1 T 13 Claims



4. A method for controlling the plating rate of an electroplating system having an electroform plating bath comprised of nickel sulfamate containing a monitored additive which reduces stress in electrodeposited nickel with an anode and an object to be plated as a cathode disposed therein, and a voltage source for generating a current flow between said anode and cathode, comprising:

disposing a metallic receptor in said bath;

establishing a current flow between said anode and metallic receptor which is related to said current flow between said anode and cathode as the ratio between the area to be placed on said object and the area of said metallic receptor;

measuring the plating induced stresses on said metallic receptor by coupling through a force transmission link a strain gauge transducer;

controlling the current between said anode and said cathode, and the current between said anode and said metallic receptor in response to said stress measurement from said transducer; and,

precisely monitoring the level of said additive and any chemical oxidation or reduction products produced during electroforming.

4,648,945

BIPOLAR PLATING OF METAL CONTACTS ONTO OXIDE INTERCONNECTION FOR SOLID OXIDE ELECTROCHEMICAL CELL

Arnold O. Isenberg, Forest Hills Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

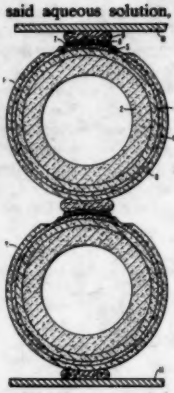
Filed Mar. 21, 1985, Ser. No. 714,650
Int. Cl.[4] C25D *5/02*
U.S. Cl. 204—15 16 Claims

1. A method of forming an adherent metal deposit on an exposed surface of an electrically-conducting ceramic comprising:

(A) placing an aqueous solution containing ions of said metal in contact with said surface;

(B) placing an ionically conducting aqueous fluid in contact with an opposing surface of said ceramic; and

(C) passing a direct current from a cathode in electrical contact with said aqueous fluid to an anode in electrical contact with said aqueous solution, with no electronic



contact to said deposit or to said surface, whereby said ions are electrochemically deposited on said surface.

4,648,946

ELECTRODE FOR ELECTROCHEMICAL PROCESSES, METHOD FOR PREPARING THE SAME AND USE THEREOF IN ELECTROLYSIS CELLS

Alberto Pellegri, Luino, Italy, assignor to Oronzio de Nora Impianti Elettrochimici S.p.A., Milan, Italy

Division of Ser. No. 791,266, Oct. 25, 1985. This application Feb. 10, 1986, Ser. No. 827,691
Claims priority, application Italy, Nov. 7, 1984, 83633 A/84
Int. Cl.[4] C25D *15/00*
U.S. Cl. 204—16 26 Claims

1. A method for forming an adherent coating of electrocatalytic ceramic material onto the surface of an inert metallic substrate, characterized in that it comprises:

(a) forming onto said surface of the substrate an anchoring pre-coating of particles of a ceramic material dispersed in an inert metallic matrix, said ceramic material being compatible with the ceramic material to be utilized for forming the subsequent electrocatalytic superficial coating, said pre-coating formed by galvanic electrodeposition for a period of time sufficient to form the desired thickness of the pre-coating, the metal of said matrix and said particles from a plating bath containing ions of the matrix metal and wherein the particles of ceramic material are held in suspension;

(b) applying onto the surface of said anchoring pre-coating a composition of precursor compounds of the electrocatalytic ceramic material selected for forming the electrocatalytic superficial coating wherein said composition is a solution or dispersion in a solvent;

(c) removing the solvent of said solution or dispersion of precursor compounds;

(d) heating at a temperature and for a time sufficient to convert said precursor compounds into said electrocatalytic ceramic material; and

(e) cooling down to room temperature.

4,648,947

CHROMIUM ELECTROPLATING AND BATH THEREFOR

John A. Naismith, Strathaven, Scotland; Malcolm McCormick; David Howe, both of Ecclesall, England, and Malcolm A. Pate, Waterthorpe, England, assignors to National Research Development Corp., London, England

Filed May 1, 1985, Ser. No. 729,216
Claims priority, application United Kingdom, May 1, 1984, 8411063
Int. Cl.[4] C25D *3/04*
U.S. Cl. 204—51 8 Claims

1. A bath composition for chromium electroplating comprising CrO_3 in a concentration of from 200 g/l to 600 g/l, sulphate

in a weight ratio SO_4:CrO_3 of from 1:120 to 1:80, perchlorate in a weight ratio ClO_4:CrO_3 of from 1:500 to 1:50, bromate in a weight ratio BrO_3:CrO_3 of from 1:50 to 1:20, and metal cations equivalent to at least half the perchlorate plus bromate.

4,648,948

ELECTROGENERATIVE OXIDATION OF LOWER ALCOHOLS TO USEFUL PRODUCTS

Thomas M. Meshbesher, 4507 Weldin Rd., Wilmington, Del. 19803

Continuation-in-part of Ser. No. 737,158, May 23, 1985, abandoned. This application May 1, 1986, Ser. No. 858,342
Int. Cl.[4] C25F *3/02*
U.S. Cl. 204—79 **8 Claims**

1. The process for making lower aliphatic aldehydes from lower aliphatic primary alcohols, wherein (a) an aqueous solution of the lower aliphatic alcohol is vaporized and brought into contact with a first surface of an anode of a fuel cell, said fuel cell including an electrolyte within the cell, an anode having a second surface in contact with the electrolyte, a cathode, and external circuit means electrically connecting the cathode to the anode, exterior to the fuel cell, and an oxidant is brought into contact with the cathode; (b) the vaporized aqueous alcohol in contact with said first surface of the anode is treated anodically by electrogeneratively oxidizing the alcohol to the corresponding aldehyde at said first surface, thereby producing a flow of current in the external circuit means; (c) removing an aldehyde-containing effluent product stream from said first surface of the anode; and (d) recovering the aldehyde from said effluent stream; characterized in that:

(1) the first-pass conversion of alcohol to the corresponding aldehyde is more than 30 mole-%;

(2) the current density produced at the anode is more than 5 ma/cm^2;

(3) the operating cell voltage is in the range of about 80 to about 350 millivolts at a cell temperature of 15°–80° C.;

(4) if any acetal is produced at the anode, the aldehyde:acetal ratio in the effluent product steam is greater than 12:1; and

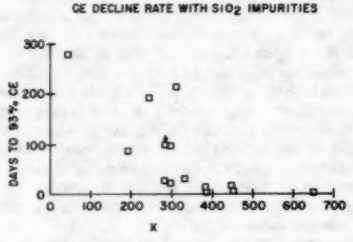
(5) the molar flow rate of alcohol to each exposed cm^2 of said first surface of the anode is greater than 2×10^{-6} mole/min.

4,648,949

PROCESS FOR ELECTROLYSIS OF SILICA-CONTAINING BRINE

Thomas C. Bissot, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 815,165, Dec. 31, 1985, abandoned. This application Jan. 8, 1986, Ser. No. 816,969
Int. Cl.[4] C25B *1/16, 1/26*
U.S. Cl. 204—98 **20 Claims**



1. In an improved process for the electrolysis of silica-containing brine in an electrolytic cell, said cell comprising a perfluorinated cation-exchange membrane situated so as to separate anode and cathode compartments, said membrane optionally coated on the cathode-facing surface with a gas- and liquid-permeable porous non-electrode coating; the improvement comprising controlling the thickness of the cation-exchange membrane, T, the concentration of silica in the brine feed, Si, the concentration of aluminum in the brine feed, Al, the concentration of calcium in the brine feed, Ca, and the current density through the membrane, CD, so that the value of X in the following equation is greater than zero and is less than about 300 when membranes having said porous non-electrode coating are used and is less than about 600 when membranes not having said porous non-electrode coating are used:

$$X=[K(Si^{0.5})(CD^{0.75})(T^{0.5})][Al+3\ Ca]$$

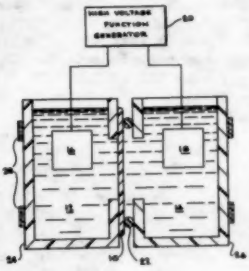
where K is 0.0237 when membranes having said porous non-electrode coating are used and is 0.0305 when membranes not having said porous non-electrode coating are used and where T is expressed in μm, Si is expressed in ppm, CD is expressed in kA/m^2 and Al and Ca are expressed in ppb.

4,648,950

CR-39 TRACK ETCHING AND BLOW-UP METHOD

Dale E. Hankins, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 15, 1985, Ser. No. 786,993
Int. Cl.[4] C25F *3/02*
U.S. Cl. 204—129.4 **11 Claims**



1. A method for enlarging to a uniform size tracks in a foil created by nuclear particles, comprising the steps of:

providing a foil with tracks created by nuclear particles;

electrochemically etching the foil at a low frequency; and

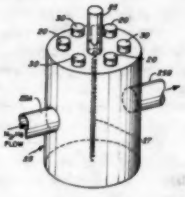
electrochemically etching the foil at a high frequency so that the etched tracks are a uniform size.

4,648,951

PHOTOIONIZATION TECHNIQUE TO ENRICH MERCURY ISOTOPES AND APPARATUS THEREFOR

Jakob Maya, Brookline, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Nov. 16, 1983, Ser. No. 552,225
Int. Cl.[4] B01J *19/12*
U.S. Cl. 204—157.21 **14 Claims**



1. A method of photoionizing naturally-occurring mercury to enrich a predetermined isotope of mercury comprising the steps of: radiating the mercury from an isotopically pure lamp radiation source so as to bring the isotope from the 6^1S_0 ground state to the 6^3P_1 state, deactivating the isotope to bring the isotope to the long lived 6^3P_0 state of mercury using a relatively large inert quenching molecule, radiating the mercury from said source to bring the isotope to the 7^3S_1 state, phot-

oionizing the isotope atom by means of a powerful optical incoherent radiation source, and collecting the predetermined ionic isotope.

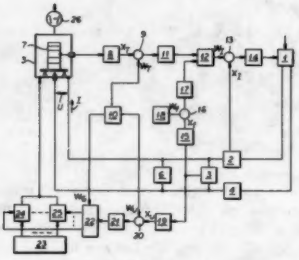
6. Apparatus for photoionizing naturally-occurring mercury to enrich a predetermined isotope of mercury comprising: an isotopically pure lamp radiation source means having radiation means for bringing the isotope from the 6^1S_0 ground state to the 6^3P_1 state, a vessel for containing the naturally-occurring mercury, a relatively large inert quenching molecule means feeding gas to the vessel to deactivate the isotope to bring the isotope to the long-lived 6^3P_0 state, said source means further having means for bringing the isotope from the 6^3P_0 state to the 7^3S_1 state, and a powerful optical incoherent radiation source for photoionizing the isotope atom to enable collection thereof.

4,648,952

METHOD OF CONTROLLING THERMOCHEMICAL TREATMENT OF WORKPIECES IN GLOW DISCHARGE IN A TREATING GAS MEDIUM AND DEVICE WHICH EMBODIES THIS METHOD

Svetoslav A. Savov; Mintcho S. Mintchev; Peter T. Nitchev, and Georgi S. Shivarov, all of Sofia, Bulgaria, assignors to VMEI "Lenin", Sofia, Bulgaria

Filed Nov. 26, 1985, Ser. No. 802,211
Claims priority, application Bulgaria, Nov. 26, 1984, 67672
Int. Cl.⁴ C23C *15/00*
U.S. Cl. 204—192.12 **2 Claims**



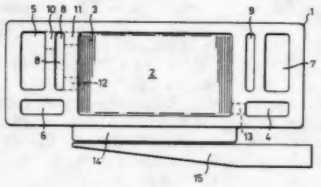
1. A method of controlling thermochemical treatment of workpieces in glow discharge in a medium of treating gas; said method involving a state of workpiece warm-up with simultaneous intensive cathode sputtering on their surface, a stage of diffusion saturation of workpieces and a stage of workpiece cooling; the workpiece temperature and the frequency of occurring arc discharges being measured during these stages; the measured values are compared with the corresponding preset values and error are signals obtained and used to create control signals characterized by the fact that at stage of workpiece warm-up with simultaneous intensive cathode sputtering on their surface the glow discharge voltage has at least one constant value corresponding to a preset value at which the workpiece cathode sputtering has a preset intensity, that at the stage of diffusion saturation at preset workpiece temperature the glow dicharge voltage has another at least one constant value corresponding to at least one preset value at which the desired workpiece properties are obtained, that at the stage of cooling the glow discharge voltage has at least one third constant value corresponding to at least one preset value at which the final properties of workpieces are obtained; during said operating stages the frequency of occurring arc discharges having arbitrary value limited in magnitude to a preset constant value of the arc discharge frequency, the workpiece temperature always having a value which corresponds to a preset increasing, constant, and decreasing value of workpiece temperature, said value being matched with the fore-mentioned at least one preset value of glow discharge voltage at which the preset intensity of cathode sputtering and the desired and final properties of workpieces are obtained; during said operating stages treating gases being used in an order which corresponds to a sequence of preset values of the glow discharge voltage, all this being controlled by regulating the flow rate of treating gases; during each operating stage besides the workpiece temperature and the frequency of occurring arc discharges, the glow discharge current and the amplitude of glow discharge current being also measured, besides the measured values of the workpiece temperature and the frequency of occurring arc discharges, the amplitude of glow discharge voltage being also compared with its preset value and the error signals obtained for the temperature and the frequency are used to create simultaneously corresponding control signals for the temperature and the frequency which are added together, and the resulting compound signal is compared with a signal proportional to the discharge current, after said comparison an error signal being obtained and used to create a control signal for the glow discharge voltage so that in accordance with the PID law the glow discharge current corresponds to the compound signal of the control signals for said temperature and said frequency, the error signal for the amplitude of glow discharge voltage is used to create a control signal for the treating gas flow rate so that in accordance with another PID law the amplitude of glow discharge voltage corresponds to the preset value.

4,648,953

ELECTROLYTIC CELL

Ian Wardle, and Keith Brattan, both of Cheshire, England, assignors to Imperial Chemical Industries plc, London, England

Filed Mar. 9, 1984, Ser. No. 588,102
Claims priority, application United Kingdom, Mar. 24, 1983, 8308187
Int. Cl.⁴ C25B *15/08, 9/00*
U.S. Cl. 204—237 **12 Claims**



1. An electrolytic cell of the filter press type comprising a plurality of anodes, cathodes and gaskets of an electrically insulating material, in which the anodes and cathodes are arranged in an alternating manner and in which an ion-exchange membrane is positioned between each adjacent anode and cathode to form in the cell a plurality of anode compartments and cathode compartments, the cell having two inlet headers from which, respectively, electrolyte may be charged to the anode compartments of the cell and from which liquors may be charged to the cathode compartments of the cell, and two outlet headers from which, respectively, products of electrolysis may be removed from the anode compartments and cathode compartments of the cell, characterised in that the gaskets comprise four openings which together form the headers or a part thereof, and the cell is provided with a common chamber in communication with each of the anode compartments and/or a common chamber in communication with each of the cathode compartments, said chamber(s) being provided with means for recirculating liquors to the anode compartments and/or to the cathode compartments, and said chamber(s) being in communication with the outlet headers from the anode compartment and/or the outlet headers from the cathode compartments.

4,648,954

MAGNESIUM ALUMINUM SPINEL IN LIGHT METAL REDUCTION CELLS

Walter W. Henslee, Lake Jackson; Stanley J. Morrow, Richwood, and John S. Lindsey, Missouri City, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 569,082, Jan. 9, 1984, abandoned. This application Oct. 30, 1985, Ser. No. 792,955

Int. Cl.[4] C25C *3/08*; C25B *11/04*; C21B *7/02*; C04B *35/02*

U.S. Cl. 204—243 R 4 Claims

1. In the electrochemical light metal production cell requiring refractory components within the cell the improvement which comprises using as the refractory components of said cells a spinel composed of magnesium aluminum oxide produced from powders of heat densifiable $MgAl_2O_4$ or fusion casting of MgO and Al_2O_3 in a ratio of 1 to 2.

4,648,955

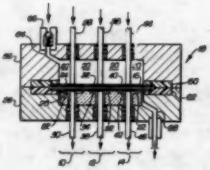
PLANAR MULTI-JUNCTION ELECTROCHEMICAL CELL

Henri J. R. Maget, Los Altos, Calif., assignor to IVAC Corporation, San Diego, Calif.

Filed Apr. 19, 1985, Ser. No. 724,912

Int. Cl.[4] C25B *9/04*, *11/00*; H01M *8/10*, *2/00*

U.S. Cl. 204—258 31 Claims



1. A planar multi-junction electrochemical pump for pumping an electrochemically active fluid, the pump comprising:

a container defining an inlet chamber in a first portion thereof and an outlet chamber in a second portion thereof;

a single electrolytic membrane disposed within the container between said chambers and forming therebetween a gas-tight seal;

a plurality of pairs of electrodes disposed on either side of and in contact with the electrolytic membrane, the electrodes in the inlet chamber being separated from one another by spaces and the electrodes in the outlet chamber being separated from one another by spaces;

means for electrically connecting the electrodes; and

means for applying an electrical voltage to the electrodes to establish a voltage gradient across the membrane to convert the fluid into ions in the inlet chamber, propel the ions through the membrane into the outer chamber, and reconvert the ions into fluid in the outlet chamber whereby the fluid is pumped from the inlet chamber into the outlet chamber.

4,648,956

ELECTRODE CONFIGURATIONS FOR AN ELECTROPHORETIC DISPLAY DEVICE

Thomas Marshall, Flushing, and Edward H. Stupp, Spring Valley, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Dec. 31, 1984, Ser. No. 688,097

Int. Cl.[4] B01K *5/00*; G02 *1/40*

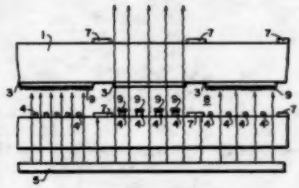
U.S. Cl. 204—299 EC 11 Claims

1. An electrophoretic display device comprising

a transparent panel including respectively a first transparent substrate, a first transparent electrode configuration on said first transparent substrate, an electrophoretic suspension, a second electrode configuration, and a second transparent substrate for mounting said second electrode configuration adjacent said electrophoretic suspension,

at least one area of said second transparent substrate being free of said second electrode configuration said first electrode configuration extending at least in alignment with said one area of said second transparent substrate, and

a light source positioned to project light through said transparent panel from one side thereof, said display device being transparent to light from said source in alignment with said area in response to the application of a potential between said first and second electrode configurations whereby an illuminated image of said area is visible at the side of said transparent panel opposite said one side upon the application of said potential between said first and second electrode configurations.



4,648,957

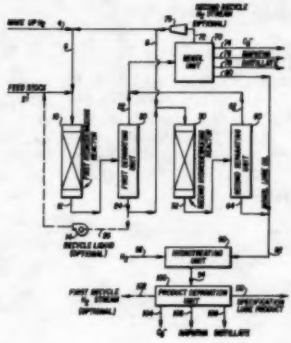
LUBE HYDRODEWAXING METHOD AND APPARATUS WITH LIGHT PRODUCT REMOVAL AND ENHANCED LUBE YIELDS

Kenneth R. Graziani, Thorofare, and Chwan P. Kyan, West Deptford, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 24, 1984, Ser. No. 685,564

Int. Cl.[4] C10G *65/10*, *65/12*, *69/12*

U.S. Cl. 208—58 21 Claims



1. A method for hydrodewaxing a hydrocarbon feedstock comprising the steps of:

(a) catalytically hydrodewaxing said feedstock by contact with a first intermediate pore crystalline zeolite catalyst under conditions sufficient to selectively convert waxy components comprising paraffins to produce a first effluent stream having an intermediate pour point of about 50° to about 70° F., wherein said first effluent stream comprises olefins;

(b) separating said first effluent stream to obtain a first vapor stream and a first liquid stream, said first liquid stream having an initial boiling point of at least 330° F., wherein

said first vapor stream comprises a portion of said olefins; and

(c) catalytically hydrodewaxing said first liquid stream by contact with a second intermediate pore crystalline zeolite catalyst under conditions sufficient to selectively convert waxy components comprising paraffins to produce a second effluent stream having a pour point less than about 30° F.

4,648,958

PROCESS FOR PRODUCING A HIGH QUALITY LUBE OIL STOCK

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 531,924, Sep. 13, 1983, Pat. No. 4,517,074, which is a division of Ser. No. 84,761, Oct. 15, 1979, Pat. No. 4,419,271. This application Mar. 26, 1984, Ser. No. 593,439

Int. Cl.[4] C10G *65/10, 65/12*

U.S. Cl. 208—59 **32 Claims**

10. A process for converting a waxy hydrocarbon feedstock containing a substantial proportion of hydrocarbonaceous material boiling above about 650° F. into a high quality lube oil stock which comprises:

(a) contacting said waxy hydrocarbon feedstock with a dewaxing catalyst in a dewaxing zone under conditions such that the pour point of said feedstock is reduced, said dewaxing catalyst comprising a molecular sieve containing pores defined by 10-membered rings of oxygen atoms;

(b) contacting at least a portion of the effluent from said dewaxing zone with molecular hydrogen in the presence of a hydrocracking catalyst in a hydrocracking zone under conditions such that a further reduction in pour point is effected, wherein said hydrocracking catalyst comprises at least one hydrogenation component selected from the group consisting of Group VIB metal components and Group VIII metal components on a support comprising a crystalline aluminosilicate Y zeolite having catalytic activity for cracking hydrocarbons and a porous refractory oxide comprising silica-alumina dispersed in a matrix of gamma alumina; and

(c) recovering a high quality lube oil stock from the effluent of said hydrocracking zone.

4,648,959

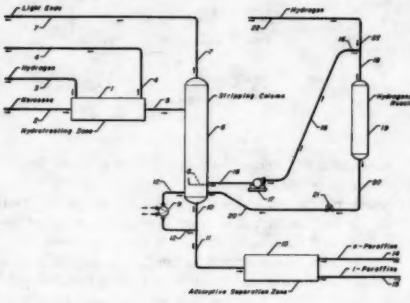
HYDROGENATION METHOD FOR ADSORPTIVE SEPARATION PROCESS FEEDSTREAMS

Raymond R. Herber, Medinah, and Angelo P. Furfaro, Des Plaines, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jul. 31, 1986, Ser. No. 891,078

Int. Cl.[4] C10G *65/04*

U.S. Cl. 208—89 **12 Claims**



9. A hydrocarbon separation process which comprises the steps:

(a) passing a feedstream, which stream comprises a first C_5-plus paraffinic hydrocarbon, a second paraffinic hydrocarbon and an olefinic hydrocarbon both having the same number of carbon atoms as said paraffinic hydrocarbon, and hydrogen into a hydrotreating zone comprising a first reaction zone containing a bed of solid catalyst and operated at hydrotreating conditions and producing a hydrotreating zone effluent stream which comprises hydrogen and said paraffinic and olefinic hydrocarbons and which contains less than about 0.05 mole percent olefinic hydrocarbons;

(b) passing the hydrotreating zone effluent stream into a stripping column operated at conditions effective to separate entering materials into a net overhead stream comprising hydrogen and a net bottoms stream comprising the first and second paraffinic hydrocarbons;

(c) collecting and withdrawing from the column as a first process stream substantially all of the liquid-phase hydrocarbons which are flowing downward through the column at a point which is below essentially all of the lowermost vapor-liquid contacting media present in the column and above a liquid retention volume provided in the bottom of the column;

(d) passing the first process stream through a second reaction zone comprising a bed of hydrogenation catalyst and operated at hydrogenation conditions and producing a second process stream comprising hydrogen and the paraffinic hydrocarbons;

(e) passing the second process stream into the liquid retention volume of the stripping column; and,

(f) passing the net bottoms stream into an adsorptive separation zone wherein the net bottoms stream is contacted with a bed of a shape selective adsorbent under adsorptive separation conditions and thereby producing a third process stream which is rich in the first paraffinic hydrocarbon and a fourth process stream which is rich in the second paraffinic hydrocarbon, and withdrawing the third and fourth process streams from the process as product streams.

4,648,960

BOUND ZEOLITE CATALYST AND PROCESS FOR USING SAID CATALYST

Kenneth R. Poeppelmeier, Edison; Walter G. Funk, Mountainside; John J. Steger, Pittstown; Shun C. Fung, Bridgewater, all of N.J.; Virginia R. Cross, and Jar-Lin Kao, both of Houston, Tex., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 550,952, Nov. 10, 1983, Pat. No. 4,595,668. This application Mar. 10, 1986, Ser. No. 837,780

Int. Cl.[4] C10G *35/06*

U.S. Cl. 208—138 **5 Claims**

1. A process for reforming naphtha which comprises (a) contacting the naphtha in the presence of hydrogen at elevated temperatures with a catalyst comprising a binder, a type L zeolite containing exchangeable cations of which at least 75% are selected from the group consisting of lithium, sodium, potassium, rubidium, cesium, calcium and barium, at least one Group VIII noble metal, the particles of which are well dispersed over the surface of the catalyst and at least 90% of the noble metal associated with the zeolite is in the form of particles having a diameter of less than about 7 Å; and (b) recovering reformed product.

4,648,961

METHOD OF PRODUCING HIGH AROMATIC YIELDS THROUGH AROMATICS REMOVAL AND RECYCLE OF REMAINING MATERIAL

Robert L. Jacobson, Vallejo, and Lawrence W. Jossens, Berkeley, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 426,376, Sep. 29, 1982. This application Aug. 17, 1984, Ser. No. 641,638

Int. Cl.[4] C10G *35/06*; C07C *2/52*

U.S. Cl. 208—138 14 Claims

1. A dehydrocyclization process comprising:

(a) contacting a naphtha feed in a reaction vessel with a dehydrocyclization catalyst at process conditions which favor dehydrocyclization to produce an aromatics product and a gaseous stream wherein said catalyst is a monofunctional catalyst comprising a large-pore zeolite containing at least one Group VIII metal;

(b) separating said aromatics product from said gaseous stream;

(c) separating normal paraffins and a substantial portion of the single-branched isoparaffins present in said aromatics product from said aromatics product; and

(d) recycling said gaseous stream and said normal and single branched isoparaffins to said reaction vessel.

4,648,962

METHOD OF BREAKING DOWN CHEMISORPTION BOND OF CLAY-CONTAINING HEAVY OIL WATER EMULSIONS

Charles E. Capes, Ottawa; Richard D. Coleman, Orleans; William L. Thayer, and Ira E. Puddington, both of Ottawa, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Continuation of Ser. No. 660,299, Oct. 12, 1984, which is a continuation-in-part of Ser. No. 411,021, Aug. 24, 1982, abandoned. This application Feb. 18, 1986, Ser. No. 830,906

Claims priority, application Canada, Jul. 29, 1981, 382750

Int. Cl.[4] C10G *1/00*; B01D *17/04*

U.S. Cl. 208—188 2 Claims

1. A method of cleaning of a coal fuel being an aqueous mixture of coal particles contaminated with hydrophilic inorganic solids and enrichment thereof with a heavy oil from a clay contaminated heavy oil emulsion having persistent chemisorption bonds of clay solids, comprising:

1. forming a suspension by mixing; (a) an aqueous mixture of coal particles contaminated with occluded hydrophilic inorganic solids, with coal particle sizes in the range of 5 to 100 μm. so that at least a substantial portion of the carbonaceous components of the coal particles is in a hydrophobic condition and a substantial portion of the contaminating occluded hydrophilic inorganic solids are therefore separatable therefrom; and (b) a heavy oil and water emulsion which is contaminated with clay having persistent chemisorption bonds;

2. agitating the so-formed suspensions until agglomerates are formed from at least a substantial portion of the carbonaceous components of the coal particles, with the heavy oil forming a bridging liquid between the carbonaceous components of the coal particles, whereby the chemisorption bonds are broken and the clay of the said emulsion is separated from the said heavy oil thereof and the said hydrophilic inorganic solids are separated from the carbonaceous components of the coal particles, and whereby the said clay and the inorganic solids remain in the water phase of the suspension and are separated from the agglomerates; and

3. separating the agglomerates from the water phase of the suspension whereby a cleaned and heavy oil enriched coal fuel is recovered.

4,648,963

HYDROFINING PROCESS EMPLOYING A PHOSPHORUS CONTAINING CATALYST

Simon G. Kukes, and Stephen L. Parrott, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 748,112, Jun. 24, 1985, Pat. No. 4,588,706. This application Jan. 29, 1986, Ser. No. 823,711

Int. Cl.[4] C10G *17/00, 45/00*

U.S. Cl. 208—216 R 18 Claims

1. A process for hydrotreating a hydrocarbon containing feed stream comprising the step of intimately contacting a substantially liquid hydrocarbon containing feed stream, which also contains compounds of sulfur and nitrogen, with a free hydrogen containing gas and a catalyst composition under such hydrotreating conditions as to produce a hydrocarbon containing stream having reduced levels of sulfur and nitrogen, wherein said catalyst composition has been prepared by a process comprising the steps of:

(A) mixing (a) at least one oxygen containing compound of a metal belonging to Group VIB of the Periodic Table, (b) at least one compound of a Group VIII metal selected from the group consisting of iron, cobalt and nickel, (c) phosphorous acid containing material, and (d) water, in such amounts and under such conditions as to obtain a solution;

(B) mixing the solution obtained in step (A) with an alumina-containing support material;

(C) heating the mixture obtained in step (B) at a first temperature under such conditions as to at least partially dry said mixture; and

(D) heating the at least partially dried mixture obtained in step (C) in an inert, non-oxidizing and non-reducing atmosphere at a second temperature, which is higher than said first temperature, under such conditions as to activate said mixture.

4,648,964

SEPARATION OF HYDROCARBONS FROM TAR SANDS FROTH

Joseph J. Leto, Broomfield; Dennis D. Gertenbach, Golden, and Daniel W. Gillespie, Wheatridge, all of Colo., assignors to Resource Technology Associates, Boulder, Colo.

Filed Aug. 30, 1985, Ser. No. 771,204

Int. Cl.[4] C10G *1/04*

U.S. Cl. 208—390 32 Claims

1. A process suitable for separating the hydrocarbon fraction from a fluid stream comprising a tar sands froth comprising:

pressurizing said stream to a treatment pressure above about 1000 psig and heating said stream to a treatment temperature above about 300° C., said pressurizing and heating being effective to produce a treated stream capable of gravity separation of the hydrocarbon fraction;

reducing the pressure on said treated stream to produce a separation pressure which is less than said treatment pressure; and separating said hydrocarbon fraction from said treated stream at said separation pressure.

4,648,965

RETORTING WITH SINTERED OR FUSED SOLIDS

Henry G. McMath, Jr., Houston, Tex., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed May 1, 1985, Ser. No. 729,335

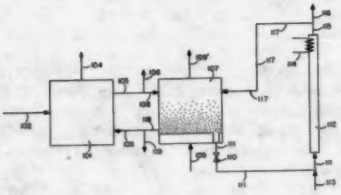
Int. Cl.[4] C10G *1/00*

U.S. Cl. 208—411 12 Claims

1. A process for retorting solid carbonaceous materials comprising:

(a) retorting a solid carbonaceous feedstock in a retorting stage at an elevated temperature in the presence of recycled solid heat carriers to produce at least a liquid product and a solid product containing residual carbon and inorganic material;

(b) heating at least a portion of said solid product in a first heating stage to a temperature within the range from about 650° F. to about 1600° F.;
(c) further heating from about 1 to about 40 wt % of the



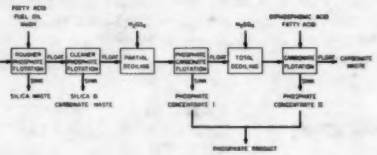
solids from step (b) in a second heating stage to a temperature above the sintering or fusion point of the inorganic material contained therein;
(d) recycling at least a portion of the solids from step (c) as solid heat carriers to step (a).

4,648,966

PROCESS FOR BENEFICIATION OF DOLOMITIC PHOSPHATE ORES

Shaung-shii Hsieh, Florence, Ala., assignor to Tennessee Valley Authority, Muscle Shoals, Ala.

Filed Dec. 2, 1985, Ser. No. 803,690
Int. Cl.[4] B03D *1/06, 1/10*
U.S. Cl. 209—167 **2 Claims**



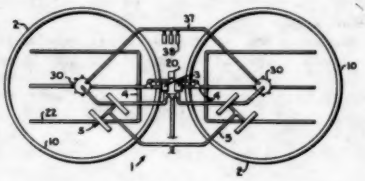
1. An ore beneficiation process which comprises the steps of:
(a) subjecting, within a pH ranging from about 8.0 to about 11 as rougher phosphate flotation feed, a phosphate ore containing coarse, weathered dolomite impurities to a rougher phosphate flotation step in the presence of from about 0.3 kg to about 2 kg of fatty acid and in amounts ranging upwards to about 4 kg of fuel oil, said weights of acid and oil based on each ton of said flotation feed;
(b) collecting substantially the phosphate values along with relatively small amounts of silica and significant amounts of said coarse, weathered dolomite impurities as phosphate rougher concentrate from the float and rejecting substantial amounts of the silica waste in the sink of step (a) supra;
(c) subjecting said phosphate rougher concentrate collected in step (b) supra to at least one cleaner flotation step to thereby reject substantial amounts of said coarse, weathered dolomite and residual silica in the sink thereof and recovering in the float therefrom phosphate cleaner concentrate;
(d) partially removing the fatty acid and fuel oil from said phosphate cleaner concentrate recovered in the float from step (c) supra by subjecting said concentrate to a partial deoiling step in the presence of from about 0.05 kg to about 0.5 kg of H_2SO_4 per ton of feed thereto;
(e) subjecting the resulting partially deoiled phosphate concentrate from step (d) supra to a phosphate-carbonate flotation step;
(f) collecting a predetermined portion of the phosphate values as a first intermediate product fraction as underflow in said phosphate-carbonate flotation in step (e) supra;
(g) collecting the float from the said phosphate-carbonate flotation in step (e) supra, and subjecting same to a total deoiling step in the presence of from about 0.07 to about 0.7 kg H_2SO_4 per ton of feed;
(h) subjecting the resulting totally deoiled phosphate concentrate from step (g) supra to a carbonate flotation step in the presence of from about 0.015 kg to about 0.2 kg of alkyl diphosphonic acid per ton of feed, and from about 0.025 kg to about 0.5 kg fatty acid per ton of feed added thereto;
(i) removing the resulting separated dolomite in the resulting float of step (h) supra;
(j) recovering as a second intermediate product fraction the resulting phosphate values in the sink of step (h) supra; and
(k) combining said phosphate values recovered as said first and said second intermediate product fractions in step (f) and step (j) supra respectively as the final phosphate product;
said process characterized by the fact that no flotation reagents are added to steps (c) and (e) supra in addition to those that are carried thereover from step (a) supra.

4,648,967

DECANTING APPARATUS

Glen R. Callthorp, 16006 Beckett La., Olathe, Kans. 66062; Kenneth L. Norcross, III, 4933 Wyandotte, Kansas City, Mo. 64112, and Dennis L. Nelson, 147 S. Normandy Dr., Olathe, Kans. 66061

Filed Sep. 20, 1985, Ser. No. 778,323
Int. Cl.[4] B01D *45/02*
U.S. Cl. 210—136 **16 Claims**



16. A sewage treatment system comprising:
(a) a reservoir suitable for holding a wastewater fluid for treatment therein;
(b) filling means for placing additional wastewater fluid in said reservoir;
(c) sludge removal means for removing sludge concentrated from said wastewater fluid from said reservoir; and
(d) a decanting apparatus for removing clarified fluid from said reservoir; said decanting apparatus comprising:
(1) a fluid receiver having an interior chamber;
(2) support structure means for mounting said receiver in the reservoir; said support structure means cooperating with said reservoir for maintaining said receiver at a generally constant depth relative to an upper fluid level within said reservoir during a decanting cycle; said support structure means comprising:
(i) an elongate drainage conduit operably flow connected to said receiver interior chamber at one end and passing through a wall of said reservoir at an opposite end;
(ii) hinge means on said conduit to allow said conduit to swing in a vertical plane relative to said wall; and
(iii) float means connected to said receiver for maintaining said receiver at a relatively fixed depth with respect to an upper level of fluid in which the apparatus is submerged;
(3) an aperture in said receiver for communicating be-

tween said receiver interior chamber and fluid in the reservoir;

(4) flap means selectively preventing flow of fluid from said reservoir into said receiver aperture; said flap means comprising:

(i) a flexible and resilient flap member positioned such that the resiliency of said member normally biases said member to such a position to prevent flow of fluid through said aperture;

(ii) said flap means includes a cover plate attached near one end thereof to said receiver and near an opposite end thereof to said flap member;

(iii) said cover plate being spaced from but in covering relation to said aperture; and

(iv) said flap member being generally U-shaped and being attached along one side thereof to said cover plate and having an opposite side biased to engage said receiver; and

(5) biasing means cooperating with said flap means to selectively prevent flow of fluid into said aperture during agitation of fluid with sludge in said reservoir such that said flap means operatively prevents entry of fluid into said receiver chamber through said aperture when substantial quantities of sludge are present throughout said fluid and when decanting is not occurring and such that said flap means allows flow of fluid from an upper portion of said reservoir into said receiver chamber through said aperture when agitation is stopped and sludge is settled to a lower portion of said reservoir and, when decanting is occurring, for precluding entry of a substantial amount of sludge into said receiver.

4,648,968

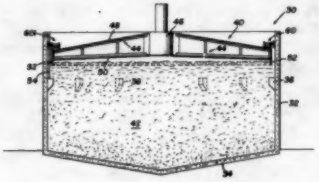
FLOATING COVER TANK WITH GUIDES FOR VERTICAL DISPLACEMENT OF THE COVER

Donald R. Cutler, Earlville, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Dec. 26, 1985, Ser. No. 813,679

Int. Cl.[4] B65D *88/46, 88/34;* **C02F** *11/04*

U.S. Cl. 210—218 **22 Claims**



1. A collecting and treating tank which holds liquid and in which a vertically movable cover floats on the liquid or on a gas layer above the liquid, comprising:

a tank having a vertical cylindrical circular wall, a bottom at and joined to the wall, and a circular cover which fits loosely inside the circular wall so that it is vertically displaceable with change in liquid and/or gas volume beneath the cover;

a plurality of cover guides, spaced radially around and peripherally spaced apart along and connected to the cover edge, which are adapted to contact and center the cover in, and maintain the cover periphery spaced from, the tank wall;

said tank having at least one guide track means fixed to the tank wall inside surface with one of the cover guides nesting with the guide track means thereby restricting rotation of the cover about a vertical axis; and

said cover guides being faced with a solid polymeric layer, which is adapted to contact the tank wall, which is slippery and has a low coefficient of friction with the tank wall inside surface, so that the cover is readily displaceable vertically solely with change in volume of liquid, gas or both beneath the cover.

4,648,969

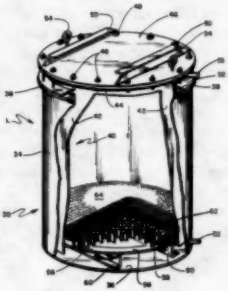
FLUIDIZED BED APPARATUS

Vernon F. Swanson, Longmont, Colo., assignor to Western States Minerals Corp., Wheatridge, Colo.

Filed Feb. 19, 1985, Ser. No. 703,192

Int. Cl.[4] B01J *8/34*

U.S. Cl. 210—237 **15 Claims**



1. A fluidized bed plate for use in controlling the flow of fluid through a fluidized bed in a fluid chamber, the fluid chamber having an inlet and an outlet above said inlet and containing a substantial quantity of particulate material, said bed plate comprising:

a porous support mounted in the chamber between the inlet and the outlet, wherein said support includes a screen with uniformly spaced openings across its surface;

a quantity of particulate material in said chamber above said support; and

a plurality of layers of shot uniformly covering and resting upon said support, voids being formed between adjacent shot, said fluid being flowable from said inlet through said porous support and the voids between shot, to fluidize said particulate material within said chamber, and flowable out through said outlet.

4,648,970

ROTARY DISC FILTER WITH PERIPHERAL CAKE SUPPORTS

Hans Hermansson, Jarfalla, Sweden, assignor to Celleco AB, Stockholm, Sweden

Filed May 3, 1985, Ser. No. 730,112

Claims priority, application Sweden, May 4, 1984, 8402398

Int. Cl.[4] B01D *33/26, 33/36*

U.S. Cl. 210—327 **6 Claims**

1. In a rotary filter intended primarily for separating fibers from a fiber suspension and comprising a plurality of annular filter discs with means for rotating the discs on a horizontal axis while immersed at their lower portions in a pool of said

suspension, each filter disc having an annular series of hollow filter bodies with walls of screen cloth, each filter body having an outlet for filtrate entering said body through said screen cloth, each filter disc being operable, during rotation thereof, to carry each of its filter bodies through said pool while fiber cakes form on the outside of the body and filtrate enters the body, and a spray nozzle for high pressure fluid located at each side of each filter disc in a removal zone above said pool, each nozzle being positioned to direct a spray of fluid against a joint where the radially outer peripheral portion of a fiber cake adheres to an adjacent side of a filter body as it passes through the removal zone from said pool, the fluid spray acting to displace said fiber cake portion away from said adjacent side and then remove said fiber cake extending radially inward from the radially outer peripheral portion of the filter disc, the improvement which comprises a supporting element located at each side of each filter disc in the vicinity of its said peripheral portion, each supporting element being operable to support a displaced upper part of a fiber cake in said removal zone and prevent said upper part from folding away from the adjacent filter disc during removal of the cake from the disc, said supporting element being spaced sufficiently from the adjacent side of the filter disc to allow fiber cake to drop from the disc.

4,648,971

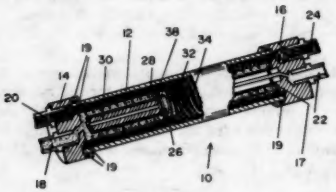
FLOW THROUGH FILTER WITH BACKFLUSH CLEARING CAPABILITY

Richard E. Pabst, 1715 Target Ct., Houston, Tex. 77043

Continuation-in-part of Ser. No. 680,399, Dec. 11, 1984, Pat. No. 4,592,848. This application Dec. 11, 1985, Ser. No. 807,506

Int. Cl.⁴ B01D *29/38*

U.S. Cl. 210—354 **12 Claims**



1. A reasable, flow-through filtering apparatus for removing particulate matter from a liquid solution comprising:

inlet means through which the solution to be filtered enters a primary filter path through the apparatus;

first outlet means through which filtrate exits said apparatus;

second outlet means through which filtered particulate matter exits said apparatus;

a filter body surrounding and housing a porous rigid filtering means, said filtering means allowing filtrate to pass through its pores and causing particulate matter to lodge on and within pores of said filtering means;

non-rigid expanding means positioned adjacent said filtering means, said non-rigid expanding means when supplied with pressure from a pressure source expanding first so as to form discrete compartments along the length of the filter path of said filtering means and secondly so as to contact the surface of said filtering means;

whereby when solution enters the filter through said inlet means the filtrate is separated from the particulate matter with the particulate matter being captured by said filtering means and

whereby when a pressure source supplies pressure to said expanding means the particulate matter is uniformly forced from the pores and surface of said filtering means into the primary filter path.

4,648,972

LIQUID DISTRIBUTOR FOR MATERIAL EXCHANGE COLUMNS

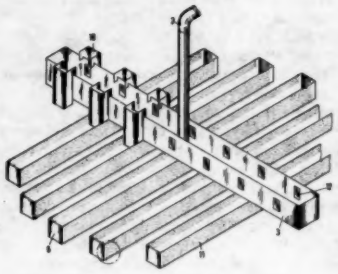
Hansjürgen Ullrich, Bochum, and Werner Geipel, Steinwiesen, both of Fed. Rep. of Germany, assignors to Paul Rauschert GmbH & Co. Kg, Pressig, Fed. Rep. of Germany

Filed Dec. 20, 1984, Ser. No. 683,812

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1983, 3346857

Int. Cl.⁴ B01D *23/20*

U.S. Cl. 210—541 **3 Claims**



1. A distributor for distributing a liquid in an exchange column which comprises:

(a) at least one predistributor means positioned to receive a liquid feed,

(b) a plurality of distributor means having substantially straight side walls and completely open top portions, said distributor means positioned to receive liquid from said predistributor means, and

(c) a body of wettable, open-pore material having an internal coherent pore structure positioned along the outside and inside longitudinal walls of said distributor means, said open-pore material bridging said outside and inside walls and positioned to receive substantially entirely all of the liquid from the distributor means and distribute said liquid within an exchange column.

4,648,973

WAY TO OXIDIZE SLUDGE WITH HIGH SOLID MATTER CONTENT

Stig-Erik Hultholm; Launo L. Lilja; Valto J. Mäkitalo, all of Pori, and Bror G. Nyman, Vanha-Ulvila, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Feb. 22, 1984, Ser. No. 582,331

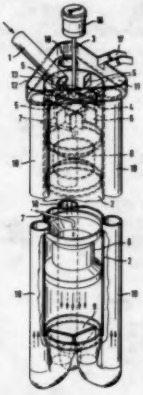
Claims priority, application Finland, Feb. 24, 1983, 830614

Int. Cl.⁴ C02F *11/02*

U.S. Cl. 210—629 **3 Claims**

1. A process for conducting oxygen or a gas containing oxygen into sludge with high solid content constituted by a pulverous solid and a liquid, for dissolving the oxygen of the gas in the sludge and for reacting it efficiently with the sludge at low energy cost, comprising conducting the sludge into the upper part of a counterbubble zone of an open reaction space with a height a multiple of its diameter and causing the sludge by effect of a pumping member to flow downwards, supplying oxygen or a gas containing oxygen into the counterbubble zone distinctly above the reactor's bottom at one or several points and at the same time throttling the sludge flow in order to achieve good dispersion, making the oxygen of the gas dissolve in the sludge and to react therewith under increasing pressure; at the lower end of the tubular space, in the zone of dissolved oxygen, turning the direction of the sludge flow substantially 180° at a turning point, and causing the sludge flow to ascend by one or several, tubular or annular ascending zones, or regasified oxygen zones, whereat in order to maintain the flow

velocity prevailing at the turning point and in the ascending zone high enough at every point, the ratio between the cross-section areas of the counterbubble zone and of the ascending zone is in the range of 0.2–3.0, when the gas content of the sludge varies the variations in level are levelled out and any harmful gas bubbles are removed from the sludge in a widening part of the ascending zone, which also encircles the upper part of the counterbubble zone and where the flow velocity of the sludge slows down; returning the undissolved oxygen into circulation in the counterbubble zone as well as the greater part of the sludge, while part of the sludge discharges as overflow over a top rim of the widening part.



4,648,974

PROCESS FOR THE SELECTIVE EXTRACORPOREAL SEPARATION OF BLOOD CONSTITUENTS

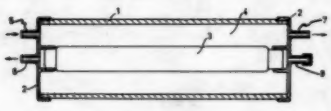
Gerhard Rosskopf, Fuldabruck-Dornhagen; Dietrich Seidel, Gottingen, and Heinrich Wieland, Waake, all of Fed. Rep. of Germany, assignors to Intermedicat GmbH, Emmenbrucke, Switzerland

Filed Mar. 14, 1984, Ser. No. 589,462

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 3310727

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—651 **19 Claims**



1. A process for the selective exteracorporeal separation of precipitates of macromolecular pathologic or toxic species from blood having serum and plasma constituents, which comprises passing the serum or plasma through a housing comprising a filter candle defining a filter body and further defining a filtering means having an inner core, said filtration means longitudinally disposed therein and providing for the collection of filtrate and the exclusion of precipitate, said housing further having an inlet and outlet in communication with said filter body and said filtering means having an effective filter surface in the range of from about 0.2 to about 2 square meters, a length in the range of from about 10 to about 60 cm, and a means pore diameter in the range of from about 0.2 to about 2 micron.

4,648,975

PROCESS OF USING IMPROVED SILICA-BASED CHROMATOGRAPHIC SUPPORTS CONTAINING ADDITIVES

Aaron Barkatt, Silver Spring, Md., and Pedro B. Macedo, 6100 Highboro Dr., Bethesda, Md. 20817, assignors to Pedro B. Macedo, Bethesda and Theodore A. Litovitz, Annapolis, both of, Md.

Continuation-in-part of Ser. No. 523,853, Aug. 17, 1983, abandoned. This application Feb. 27, 1986, Ser. No. 833,263

Int. Cl.[4] B01D *15/08*

U.S. Cl. 210—656 **3 Claims**

1. A process for separating materials by liquid chromatography comprising passing said materials through a chromatographic column packed with the chromatographic support formed from porous glass or silica gel modified by a process comprising treating said porous support with a solution of a metal selected from the group consisting of aluminum, iron, zirconium, titanium, chromium, tin, lanthanum, rare earth, alkaline earth, zinc, hafnium, thorium and gallium to sorb said metal onto the porous support and separating said materials on passage of one or more mobile phases having a pH above about 7.5 or a temperature above about 35° C. through said chromatographic column.

4,648,976

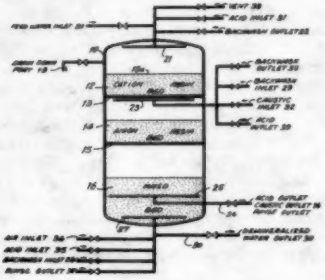
INTEGRAL WATER DEMINERALIZER SYSTEM AND METHOD

James Y. Chen, Florham Park, N.J., assignor to Belco Pollution Control Corporation, Parsippany, N.J.

Filed Mar. 7, 1985, Ser. No. 709,738

Int. Cl.[4] C02F *1/42*

U.S. Cl. 210—678 **15 Claims**



1. A system for demineralizing water using multiple beds of ion exchange resins connected in series flow arrangement within a single vessel, comprising:

(a) a pressurizable vessel containing three beds of ion exchange resins;

(b) a first bed containing a cation type particulate resin material, said bed being located in the upper portion of said vessel and supported on porous support means;

(c) a second bed containing an anion type particulate resin, said bed located in the middle portion of said vessel and vertically separated from said first bed and supported on porous support means;

(d) a flow distrubutor located between said first and second beds for introduction and withdrawal of liquids therebetween;

(e) a third bed containing mixed cation and anion type particulate resins located in the lower portion of said vessel and vertically separated from said second bed, said third bed having a flow distributor located within the bed for withdrawal of liquids; and

(f) conduit and valve means connected to said vessel and arranged for feeding raw water and withdrawing demin-

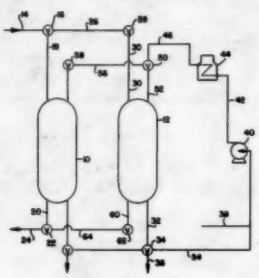
erallized water and for flushing and regenerating said resin beds, whereby the raw feed water enters at the top of said vessel and flows downwardly through the three resin beds in series flow arrangement to demineralize the water.

4,648,977

PROCESS FOR REMOVING TOXIC ORGANIC MATERIALS FROM WEAK AQUEOUS SOLUTIONS THEREOF

Desh R. Garg, Hopewell Junction, and James S. Ritscher, Ossining, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 30, 1985, Ser. No. 814,897
Int. Cl.[4] C02F *1/28*
U.S. Cl. 210—673 **8 Claims**



1. Cyclic process for purifying aqueous media containing dissolved organic impurities which comprises providing a water feedstock containing from about 10 ppb (wt.) to about 20,000 ppm (wt.) of dissolved organic compounds, contacting said feedstock with an adsorptive mass of an organophilic zeolitic molecular sieve, said molecular sieve having pore diameters large enough to adsorb at least some of said organic compounds whereby said organic compounds are adsorbed thereon and a purified water product is obtained, removing the organic compound-laden molecular sieve from contact with the purified water product and simultaneously regenerating said molecular sieve and oxidatively destroying at least a portion of the organic adsorbate thereon by contact with an aqueous solution of a compound having a standard oxidation potential of at least 0.25 volt, and thereafter again contacting the regenerated molecular sieve with additional water feedstock to be purified.

4,648,978

PROCESS FOR THE CONTINUOUS PREPARATION OF STERILE, DEPYROGENATED SOLUTIONS

Ralph W. Makinen, and James R. Rickloff, both of Erie, Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Apr. 24, 1985, Ser. No. 726,422
Int. Cl.[4] C02F *1/78, 1/72*
U.S. Cl. 210—759 **14 Claims**

1. A sterilizing and depyrogenating process comprising the steps of:

treating a stream of a solution to remove contaminants therefrom;

adding a discrete amount of an oxidant selected from the group consisting of hydrogen peroxide and ozone to said stream of treated solution;

heating said stream of such treated solution and said oxidant to a temperature in the range of about 212° F. to 300° F. and for a period of time less than about ten minutes sufficient to simultaneously sterilize and depyrogenate such treated solution while said solution is being heated, said amount of oxidant added to said stream of solution being effective, when said stream of solution and said oxidant are heated to said temperature, to depyrogenate said solution; and

removing any residual of said oxidant from said stream of such treated, sterilized, depyrogenated solution.

4,648,979

DETERGENT COMPOSITION

Michael W. Parslow, Upton by Chester, Great Britain, and Jacobus R. Nool, Hellevoetsluis, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Aug. 27, 1985, Ser. No. 769,654
Claims priority, application United Kingdom, Aug. 29, 1984, 8421801
Int. Cl.[4] C11D *3/30, 3/386*
U.S. Cl. 252—8.8 **7 Claims**

1. A detergent composition for cleaning and softening fabrics comprising:

(a) from 2 to 50% by weight of a detergent-active material selected from the group of anionic, nonionic, zwitterionic and amphoteric synthetic detergent-active materials;

(b) from 0.5 to 15% by weight of an amine selected from the group of primary amines having a C_{12}–C_{25} alkyl or alkenyl group, and secondary amines having the general formula:

$$R_1R_2NH$$

wherein

R_1 is a C_{12}–C_{26} alkyl or alkenyl group

and R_2 is a C_1–C_7 alkyl or alkenyl group and

(c) from 0.1 to 10% by weight of a bacterial or fungal cellulase having a pH optimum of between 5 and 11.5.

4,648,980

HYDROCARBON SOLUBLE NITROGEN CONTAINING DISPERSANT - FLUOROPHOSPHORIC ACID ADDUCTS

Timothy R. Erdman, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 745,566, Jun. 17, 1985, Pat. No. 4,615,826, which is a continuation-in-part of Ser. No. 534,858, Sep. 22, 1983, abandoned. This application Apr. 25, 1986, Ser. No. 856,624
Int. Cl.[4] C10M *137/00*
U.S. Cl. 252—32.5 **15 Claims**

1. A hydrocarbon-soluble fluorophosphoric acid adduct which comprises the reaction product of:

(a) a Mannich base or borated Mannich base having at least one basic nitrogen; and

(b) a flurorphosphoric acid or ammonium salt thereof wherein the amount of said fluorophosphoric acid or salt thereof is from about 0.1 to 1 equivalent per equivalent of basic nitrogen in said Mannich base or borated Mannich base.

4,648,981

PENETRATING OIL AND METHOD OF PREPARATION

Casner A. Dulin, 109 Soland Ave., Denver City, Tex. 79323

Filed Apr. 4, 1986, Ser. No. 848,700
Int. Cl.[4] C10M *137/06, 135/10*
U.S. Cl. 252—32.7 E **14 Claims**

1. A penetrating oil, comprising:

(a) from about 1 part to about 5 parts of a formula oil comprising a lubricating oil and surface active agents, said lubricating oil having a viscosity of from between about 135 to about 220 SSU at 100° F.;

(b) from about 20 parts to about 30 parts of a hydrocarbon-based viscosity controller having a viscosity of from between about 75 to about 200 SSU 100° F.; and,

(c) from about 65 to about 80 parts of a hydrocarbon-based volatility controller having a viscosity of from between about 32 to about 45 SSU 100° F.

4,648,982

STABILIZERS FOR SILICATES IN ANTIFREEZE COMPOSITIONS

Serjio Gritti, Geneva, Switzerland, assignor to BP Chemicals Limited, London, England

PCT No. PCT/GB85/00060, § 371 Date Sep. 18, 1985, § 102(e) Date Sep. 18, 1985, PCT Pub. No. WO85/03719, PCT Pub. Date Aug. 29, 1985

PCT Filed Feb. 14, 1985, Ser. No. 779,782

Claims priority, application United Kingdom, Feb. 17, 1984, 8404208

Int. Cl.[4] C09K 5/00

U.S. Cl. 252—75 5 Claims

3. An antifreeze composition comprising an alkylene glycol, a silicate inhibitor and a stabiliser of the general formula:

$$HO(C_nH_{2n}O)_xCH_2CH(OH)CH_2O(CH_2)_3SiO_{1.5} \quad (II)$$

4,648,983

BUILT NON AQUEOUS LIQUID NONIONIC LAUNDRY DETERGENT COMPOSITION CONTAINING UREA STABILIZER AND METHOD OF USE

Guy Broze, Grace-Hollogne, and Jean-Paul Delvenne, Tilff, both of Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 20, 1985, Ser. No. 767,569

Int. Cl.[4] C11D 3/06

U.S. Cl. 252—135 17 Claims

1. A non-aqueous fabric treating detergent composition which comprises a suspension of insoluble inorganic builder salt particles in 10 to 60 percent of a nonionic liquid surfactant detergent, and 0.1 to 5% of an urea compound anti-settling agent to increase the stability of the suspension.

4,648,984

NOVEL POLYGLYCOL ETHERS AND USE THEREOF

Horst-Jürgen Krause; Andreas Syldatk, both of Duesseldorf, and Eric Sung, Monheim, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

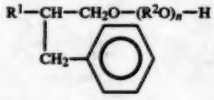
Filed May 29, 1986, Ser. No. 868,903

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1985, 3520185

Int. Cl.[4] C07C 43/164, 43/178; C11D 1/72; C08G 65/34

U.S. Cl. 252—174.22 9 Claims

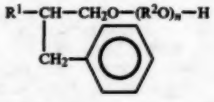
1. 2-benzyl-1-alkanol polyglycol ethers having the formula:



(I)

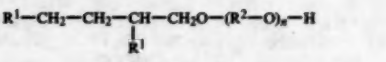
in which R^1 represents an alkyl group having from about 6 to about 22 carbon atoms; R_2 is an alkylene group having from 2 to 6 carbon atoms and n is an integer from 1 to about 100.

9. A cleaning composition comprising a mixture of a 2-benzyl-1-alkanol polyglycolether having the formula:



(I)

and an ethoxylated alcohol having the formula:



in which formula the symbol R^1 represents an alkyl group having from about 6 to about 22 carbon atoms; R_2 is an alkylene group having from 2 to 6 carbon atoms; and n is an integer from 1 to about 100.

4,648,985

EXTREME PRESSURE ADDITIVES FOR LUBRICANTS

Paul W. Thorsell, Rockwall, and Mark A. Mulvihill, Garland, both of Tex., assignors to The Whitmore Manufacturing Company, Rockwall, Tex.

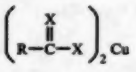
Continuation of Ser. No. 671,760, Nov. 15, 1984. This application Jul. 7, 1986, Ser. No. 882,040

Int. Cl.[4] C10M 157/04, 157/10

U.S. Cl. 252—32.5 21 Claims

1. An extreme pressure lubricant comprising a base and an extreme pressure additive system comprising:

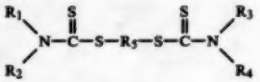
(a) an organic copper compound of the formula I



I

where X is sulphur or oxygen, if X is sulphur, R is an amine; if X is oxygen, R is hydrogen or hydrocarbon having 1 to 22 carbon atoms;

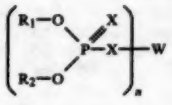
(b) a dithio carbamate of the formula II



II

where R_1–R_4 can be the same or different, and are selected from the group of hydrogen and hydrocarbon of 1 to 22 carbon atoms and R_5 is a hydrocarbon having 1 to 8 carbon atoms; and

(c) an organic phosphate of the formula III



III

where X is sulphur or oxygen, n is 1–4, R_1 and R_2 are the same or different, and are selected from the group of hydrogen and hydrocarbon of 1 to 22 carbon atoms, and W is hydrogen, hydrocarbon, or amine of 1 to 22 carbon atoms, or a metal selected from the group consisting of the heavy metals, the light metals, the alkali metals and the alkaline earth metals; and whereby copper is provided by the extreme pressure additive system in a sufficient quantity and form to be accessible for copper plating under extreme pressure conditions and the extreme pressure additive system is sufficiently stable for usage and storage.

4,648,986

COMPOSITIONS BASED ON MIXTURES OF ETHYLENE-ETHYL ACRYLATE COPOLYMERS AND ETHYLENE-VINYL ACETATE-VINYL CHLORIDE TERPOLYMERS

Kunio Kotani; Akio Hayashi, and Seibo Taniguchi, all of Yokohama, Japan, assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 747,186, Jun. 21, 1985, Pat. No. 4,598,127. This application Mar. 7, 1986, Ser. No. 837,163

Claims priority, application Japan, Sep. 5, 1984, 59-184543

Int. Cl.[4] H01B *1/06*; C08K *3/04*

U.S. Cl. 252—511 **8 Claims**

1. A composition having adhesion to and strippability from crosslinked olefin polymers comprising an ethylene-ethyl acrylate copolymer having a melt index of 1 to 50 grams/10 minutes and containing about 30 to 50 percent by weight combined ethyl acrylate; an ethylene-vinyl acetate-vinyl chloride terpolymer containing about 30 to about 85 percent by weight ethylene, about 5 to about 60 percent by weight combined vinyl acetate, and about 10 to about 70 percent by weight combined vinyl chloride, wherein the amount of terpolymer is about 18 to about 330 parts by weight per 100 parts by weight copolymer; and carbon black in an amount sufficient to render said composition semiconductive.

4,648,987

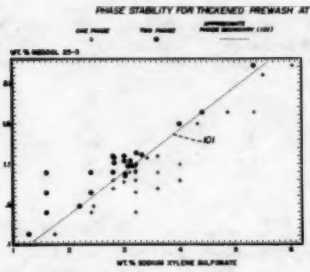
THICKENED AQUEOUS PREWASH COMPOSITION

William L. Smith, Pleasanton, and Barbara H. Munk, Albany, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Feb. 13, 1985, Ser. No. 701,368

Int. Cl.[4] C11D *1/831, 3/14, 3/37*

U.S. Cl. 252—559 **14 Claims**



1. An aqueous laundry prewash composition for treating fabric spots, stains and the like, comprising

a cosurfactant system including a first hydrophobic nonionic surfactant for loosening oil soluble material from the fabric and a second hydrophilic nonionic surfactant for loosening water soluble material from the fabric, the hydrophobic nonionic surfactant being an oil soluble ethoxylated alcohol with about eight to eighteen carbon atoms and an average of about two to five ethylene oxide groups per molecule, the hydrophilic nonionic surfactant being a water soluble ethoxylated alcohol with about eight to eighteen carbon atoms and an average of about five to fifteen ethylene oxide groups per molecule, the cosurfactant system forming about 3.7–10.5 weight percent of the composition,

a hydrotrope selected for stabilizing the cosurfactant system and particularly the first hydrophobic nonionic surfactant in the prewash composition, the hydrotrope being a benzene or naphthalene sulfonate derivative containing one or more short chain alkyl substituents with about one to four carbon atoms, the hydrotrope forming about 1.6–10.0 weight percent of the composition,

Xanthan gum as a thickener for maintaining viscosity of the composition in a thickened condition and for achieving localized engagement of the composition on the fabric spots and stains, the thickener forming about 0.1–2 percent by weight of the composition, and

water forming the balance of the compositions as a predominant component thereof,

the hydrotrope being present in the composition in a ratio of at about three parts for each part of the first hydrophobic nonionic surfactant in order to assure stability of the thickened prewash composition.

4,648,988

WATER-DILUTABLE WOOD-PRESERVING LIQUIDS

Paul C. M. Van Dijck, Brecht; Theo F. M. C. Ligtvoet, Vlimmeren, and Leo J. J. Van Leemput, Wakkerzeel-Hasch, all of Belgium, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 564,121, Dec. 21, 1983, abandoned. This application Oct. 15, 1984, Ser. No. 660,817

Int. Cl.[4] C09D *5/18*; C09K *21/00, 21/10, 21/08*

U.S. Cl. 252—602 **8 Claims**

1. A water-dilutable wood-preserving liquid containing

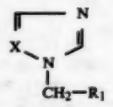
(i) from 10% w/w to 80% w/w of 2-butoxyethanol or butyl 2-hydroxyacetic acid ester;

(ii) from 20% w/w to 80% w/w of a solubilizer selected from the group consisting of:

(a) addition products of 1 to 60 moles of ethylene oxide with 1 mole of a phenol which is further substituted with at least one C_1–C_{15} alkyl group; and

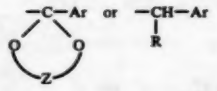
(b) addition products of 1 to 60 moles of ethylene oxide with 1 mole of ricinus oil; and

(ii) from 0.01% w/w to 10% w/w of at least one azole having the formula



(I)

or an acid addition salt thereof, wherein X is nitrogen or a CH group and R_1 is a radical of the formula



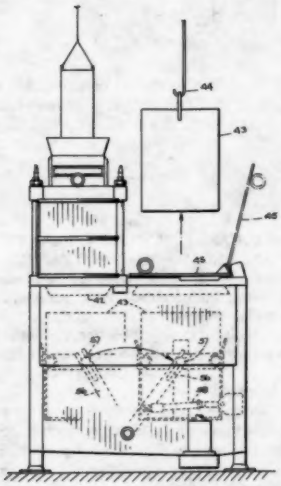
wherein Z is a group —CH_2—CH_2—, —CH_2—CH-2—CH_2—, —$CH(CH_3)$—$CH(CH_3)$— OR —CH_2—CH-(alkyl)—, wherein said alkyl is a straight or branched C_1–C_{10} alkyl radical; said Ar is a phenyl group which is optionally substituted with 1 to 3 halogens, C_1–C_6 alkyl radicals, C_1–C_6 alkoxy radicals, cyano-, trifluoromethyl- or nitro groups, a thienyl-, halothienyl-, naphthalenyl- or fluorenyl group; and, said R is C_1–C_{10} alkyl, cycloalkyl, cycloalkyllower alkyl, lower alkenyl, aryllower alkyl, aryloxylower alkyl or a radical of the formula —O—R_o, wherein said R_o is C_1–C_{10} alkyl, lower alkenyl, lower alkynyl or aryllower alkyl, wherein said aryl radical is phenyl, naphthalenyl or substituted phenyl, wherein said substituted phenyl has 1 to 3 substituents selected from the group consisting of halo, cyano, nitro, phenyl, lower alkyl and lower alkoxy, provided that when more than one substituent is present only one thereof may be cyano, nitro or phenyl.

4,648,989

UNDERWATER COMPRESSING AND CUTTING APPARATUS

William J. Klein, Wayne, N.J., assignor to Wastechem Corporation, Paramus, N.J.

Filed Feb. 27, 1985, Ser. No. 706,046
Int. Cl.[4] G21F 9/34; B23P 19/00; G21C 19/36
U.S. Cl. 252—626 14 Claims



1. Underwater compressing and cutting apparatus for activated or contaminated components of the core of a nuclear reactor comprising:

a frame;

first squeezing means attached to said frame;

first controllable displacing means attached to said frame;

a first assembly that is movable by said controllable displacing means and comprising second squeezing means and sled means supporting said second squeezing means and slidable on said frame and having vertically extending, horizontally spaced sliding means joined by transversely extending means, said tranversely extending means being displaceable by said controllable displacing means for displacing said slidable means and said second squeezing means together in two directions on said frame to compress and release the core components;

said frame comprising a first horizontal removable member above and in contact with said vertically extending, horizontally spaced sliding means of said first assembly;

said frame also comprising a second horizontal removable member below and supporting said vertically extending, horizontally spaced sliding means of said first assembly; and

said frame also comprising removable vertical side members between said horizontal members and having surfaces against which said sled means slides;

second controllable displacing means attached to said frame;

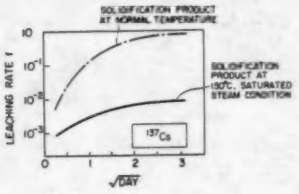
a second assembly which is separately movable by said second controllable displacing means, and said second assembly comprising a knife and sled mean supporting said knife slidable on said frame and having vertically extending, horizontally spaced sliding means joined by transversely extending means, said transversely extending means of said second assembly being displaceable by said second controllable displacing means for displacing said second slidable means and said knife together in two directions on said frame to cut the core components.

4,648,990

SOLIDIFIED RADIOACTIVE WASTES AND PROCESS FOR PRODUCING THE SAME

Naohito Uetake; Fumio Kawamura, both of Hitachi; Hideo Yusa, Katsuta; Makoto Kikuchi, and Shin Tamata, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 14, 1984, Ser. No. 681,907
Claims priority, application Japan, Dec. 16, 1983, 58-236284
Int. Cl.[4] G21F 9/16; C09D 1/02
U.S. Cl. 252—628 27 Claims



1. A process for producing solidified radioactive wastes by covering and immobilizing radioactive wastes with solidifying material, comprising:

mixing a solution of alkali silicate, a curing agent for curing said solution of alkali silicate and radioactive wastes with each other to form a mixture; and

thereafter, heating the mixture to a temperature of about 100 degrees C or higher while maintaining the mixture in a high humidity environment of at least substantially saturated steam thereby curing said solution of alkali silicate to obtain solidified radioactive wastes without substantial vaporization of free water within the mixture that would cause undesirable pores and like defects.

4,648,991

PYROELECTRIC CRYSTALS WITH HIGH FIGURES OF MERIT

Chang-Shui Fang, Shan Dong; Yao Xi, Shaan-xi; Zhi-Xiong Chen, Wuhan, all of China; Amar S. Bhalla, and Leslie E. Cross, both of State College, Pa., assignors to Research Corporation, Tucson, Ariz.

Filed May 30, 1984, Ser. No. 615,203
Int. Cl.[4] H01J 31/26; C09K 3/00; H01L 35/12
U.S. Cl. 252—1 18 Claims

1. A pyroelectric crystal having a p/K value of ≧1.8.

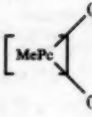
4,648,992

WATER-SOLUBLE PHTHALOCYANINE COMPOUNDS

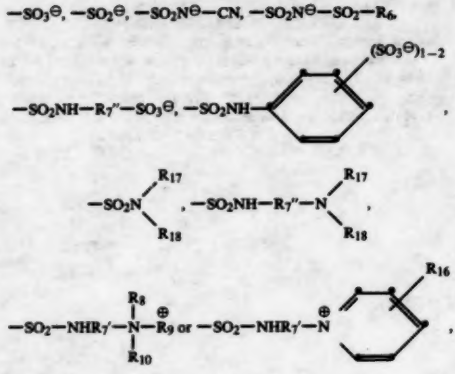
Gregor Graf, Basel; Gerd Hölzle, Liestal, and Gerhard Reinert, Allschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 11, 1985, Ser. No. 700,203
Claims priority, application Switzerland, Feb. 17, 1984, 779/84
Int. Cl.[4] C07D 487/22
U.S. Cl. 540—124 7 Claims

1. A phthalocyanine compound of the formula



in which MePc is the Ge(IV)-phthalocyanine ring system, A is a group of the formulas



wherein R_6 is C_1–C_4-alkyl, phenyl, (C_1–C_4-alkyl)-phenyl, chlorophenyl or methoxyphenyl, R_7' is C_2–C_6-alkylene, R_7'' is C_1–C_6-alkylene, R_8, R_9 and R_{10} independently of one another are C_1–C_4-alkyl which is unsubstituted or substituted by hydroxyl, halogen or phenyl, R_{16} is C_1–C_4-alkyl, halogen or hydroxyl and R_{17} and R_{18} independently of one another are hydrogen, alkyl, hydroxyalkyl or halogenoalkyl being 1–6 C atoms in each case, or phenyl or, together with the nitrogen atom to which they are attached, are the piperidine, piperazine or morpholine ring, Z, as a counter-ion for an anionic group, is a hydrogen ion, alkali metal ion, an unsubstituted ammonium ion or a substituted ammonium ion of the formula

in which R', R'' and R''' independently of one another are hydrogen or alkyl of 1–4 carbon atoms which is unsubstituted or substituted by halogen, hydroxyl, phenyl or cyano, at least one R-substituent being other than hydrogen, and two R-radicals together with the ammonium nitrogen can be piperidine, piperazine, morpholine, pyrrolidine or imidazolidine, for a cationic group is a halide ion, alkylsulfate ion, a benzenesulfonate ion, a toluenesulfonate ion, a p-chloro-benzenesulfonate ion, a sulfate ion, a phosphate ion or the ion of an organic carboxylic acid, and, for a nonionic group, is zero, n is number from 1 to 4, p is number from 0 to 4 and Y is halogen, alkyl or phenyl, it being possible for different types of substituents A and/or Y to be present in the molecule.

4,648,993

CATIONIC PHTHALOCYANINE DYES

Horst Colberg, Schifferstadt, and Udo Mayer, Frankenthal, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

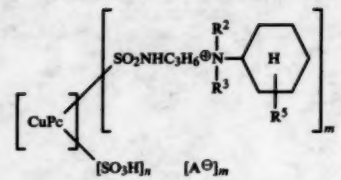
Filed Jul. 8, 1985, Ser. No. 752,598

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1984, 3425132

Int. Cl.[4] C09B 47/32

U.S. Cl. 540—134 **6 Claims**

1. A compound useful for dyeing acid-modified fibers, having the formula



where R^5 is hydrogen, methyl or ethyl; R^2 and R^3 are each methyl, ethyl, β-hydroxyethyl, β-hydroxypropyl or benzyl; A^- is an anion, m is 2 or 3 and n is 0.1 to 1 based on statistical averages.

4,648,994

PROCESS FOR THE PREPARATION OF 1-AMINO-2-BROMO-4-HYDROXYANTHRAQUINONE

Rolf Müller, Aesch; Hans Niederer, Binningen, and Othmar Hahn, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 24, 1986, Ser. No. 822,178

Claims priority, application Switzerland, Feb. 4, 1985, 492/85

Int. Cl.[4] C07C 97/26

U.S. Cl. 260—380 **8 Claims**

1. A process for the preparation of 1-amino-2-bromo-4-hydroxyanthraquinone which comprises brominating 1-aminoanthraquinone in the 2- and 4-position in concentrated sulfuric acid, removing excess bromine and/or hydrobromic acid formed during the bromination from the reaction mixture and carrying out the hydrolysis at elevated temperature in the presence of an aldehyde.

4,648,995

CHEMICAL SYNTHESIS

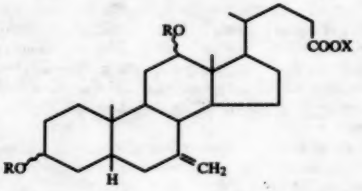
Erwin H. Mosbach; Charles K. McSherry, and Syoji Kuroki, all of New York, N.Y., assignors to Beth Israel Medical Center, New York, N.Y.

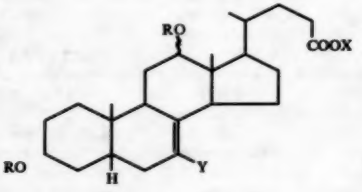
Continuation-in-part of Ser. No. 548,078, Nov. 2, 1983, Pat. No. 4,545,938. This application Jul. 3, 1985, Ser. No. 751,552

Int. Cl.[4] C07J 9/00

U.S. Cl. 260—397.1 **2 Claims**

1. A compound of the formulae,





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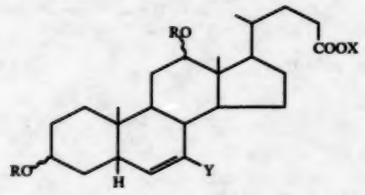


wherein R, is H or acyl; X is H, acyl or alkyl and Y is lower alkyl, aryl, alkyl substituted aryl, vinyl or cycloalkyl.

4,648,996

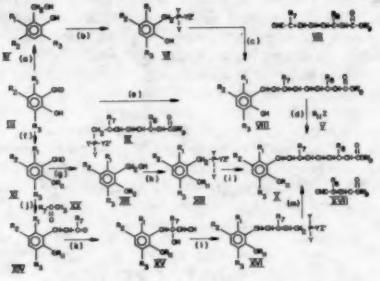
PHENYL SUBSTITUTED-2,4,6,8-NONATETRAENOIC ACID

Edward R. Aig, Fair Lawn; John W. Coffey; Allen J. Lovey, both of West Caldwell, and Michael Rosenberger, Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

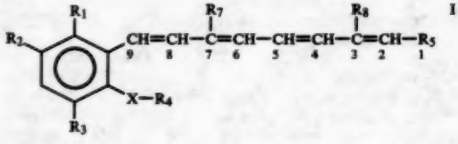
Continuation-in-part of Ser. No. 635,100, Jul. 27, 1984, abandoned. This application Jun. 20, 1985, Ser. No. 746,812

Int. Cl.[4] C11C *3/00*; A61K *31/05, 31/20, 31/23*

U.S. Cl. 260—410.9 R **11 Claims**

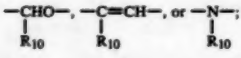


1. A compound selected from the group of phenyl derivatives of the formula:



I

wherein R_1 is hydrogen, lower alkyl, chlorine, fluorine or trifluoromethyl; R_2 is chlorine, trifluoromethyl, lower alkyl, fluorine, hydroxy, loweralkoxy, trifluoromethylloweralkoxy, or hydrogen; R_3 is hydrogen, lower alkyl, chlorine, or fluorine; R_4 is an alkyl group having a straight chain length of 4 to 9 carbon atoms; X is



R_5 is $COOR_9$; and R_7, R_8, R_9, and R_{10} are hydrogen or lower alkyl

and pharmaceutically acceptable salts thereof.

4,648,997

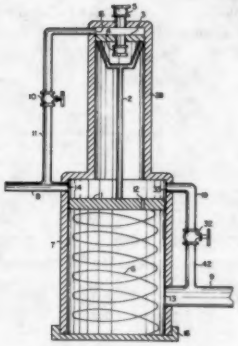
AIR INJECTOR

Stephen C. Tarver, P.O. Box 127, Gillette, Wyo. 82716

Continuation-in-part of Ser. No. 712,970, Mar. 18, 1985, abandoned. This application Jan. 27, 1986, Ser. No. 822,630

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—25 **1 Claim**



1. A device to inject air into water under pressure comprising: An elongated closed housing around two pistons connected to each other by a connecting rod and positioned to slide alternately toward one end of said housing and then toward the other, said pistons being propelled in one direction by the pressure of water entering said housing through an opening from an outside source and propelled in the opposite direction by a coil spring and including a means to alternately increase and decrease water pressure against one piston so that the coil spring is repeatedly being compressed and allowed to expand, causing the second piston to draw in air through a check valve which is mounted in the outer wall of the housing, said air then passing through a second check valve which is mounted in said second piston resulting in a mixing of air and water which air and water leave said housing through one or more openings.

4,648,998

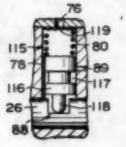
CHARGE FORMING APPARATUS

Satoru Araki, Zama, Japan, assignor to Shingawa Daikasuto Kogyo Kabushiki Kaisha, Japan

Filed Mar. 11, 1985, Ser. No. 710,221

Int. Cl.[4] F02M *7/08*

U.S. Cl. 261—34.2 **7 Claims**



3. A charge forming apparatus comprising:

a body which is formed therein with a mixture passage having a throttle valve arranged therein;

a fuel pressure control mechanism arranged on said body, said fuel pressure control mechanism comprising a fuel chamber from which controlled fuel is fed to said mixture passage and a flexible diaphragm defining one of the walls of said fuel chamber;

cam means formed at a throttle shaft supporting said throttle valve thereon;

an acceleration mechanism comprising an acceleration pump and a passage for supplemental fuel, said acceleration pump comprising a cylindrical chamber formed in said body, a piston received in said cylindrical chamber and spring means for contacting said piston with said cam means, said passage for supplemental fuel being communicated with said cylindrical chamber; and

a screen arranged to cover the opened connection of said passage with said cylindrical chamber.

4,648,999

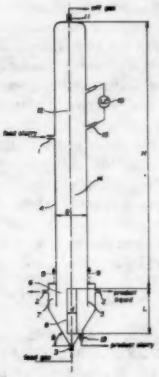
APPARATUS FOR CONTACTING FLUID WITH SOLID

Robert B. Armstrong, Katy; Hulbert S. Jongenburger, Houston, and Pasupati Sadhukhan, Katy, all of Tex., assignors to M. W. Kellogg Company, Tex.

Filed Jul. 22, 1985, Ser. No. 758,210

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—77 **14 Claims**



1. An apparatus for contacting liquid combined with solids and a gas, comprising a cylindrical vessel (4) having a feed inlet (1) for receiving a liquid, a liquid outlet (2) for discharging a liquid, and, at a bottom of said cylindrical vessel, a gas inlet (3) for receiving gas to establish an ascending passage of gas into said cylindrical vessel, a baffle (5) with a cylindrical skirt portion disposed in said cylindrical vessel and defining a stilling chamber (7) on an outside region of said baffle, a lower end of said baffle being much lower than said liquid outlet and said liquid outlet being connected into said stilling chamber, and a cylindrical member (8) disposed in said cylindrical vessel spaced above said bottom of said cylindrical vessel and below a top of said cylindrical vessel, said cylindrical member being disposed along said ascending passage of gas in said vessel for receiving gas from said gas inlet, an upper end of said cylindrical member being higher than said lower end of said baffle and also higher than said liquid outlet connected into said stilling chamber, said cylindrical vessel having a main contacting section above said cylindrical member with a height and said cylindrical member having a length, a ratio of said height of said main contacting section to said length of said cylindrical member (H/L) being within the range of 2 and 50.

4,649,000

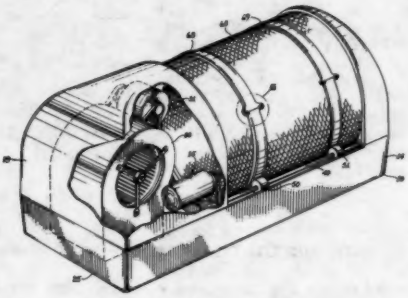
EVAPORATIVE COOLER

William M. Biesemeyer, 1703 N. Doran, Mesa, Ariz. 85203

Filed Dec. 9, 1985, Ser. No. 806,403

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—92 **3 Claims**



1. An evaporative cooling system comprising:

(a) a tray for holding water;

(b) a hollow cylindrical evaporative pad having two ends mounted for rotation about a horizontal axis above said tray with a lower portion of said pad immersed in said water;

(c) a pair of rotating support shafts mounted for rotation about an axis parallel to the rotational axis of said cylindrical pad, each of said shafts including a roller mounted thereon for contacting, supporting, and imparting rotational movement to said cylindrical pad;

(d) said cylindrical pad including a circumferential band mounted thereon and spaced from said ends;

(e) said cylindrical pad, mounted, supported, and rotated through contact between said circumferential band and said rollers, and positioned for free vertical movement into and out of contact with said rollers to permit removal of said cylindrical pad from said system without disassembly of any part of said system.

4,649,001

PROCESS FOR PRODUCING POLYETHYLENE EXTRUDED FOAMS

Hisao Nakamura, Utsunomiya, and Shoji Iwano, Nishikata, both of Japan, assignors to Japan Styrene Paper Corporation, Tokyo, Japan

Filed Apr. 16, 1985, Ser. No. 723,835

Claims priority, application Japan, Apr. 17, 1984, 59-77184; Apr. 20, 1984, 59-79878

Int. Cl.[4] B29C *67/22*; C08J *9/04*; C08L *23/20*

U.S. Cl. 264—50 **9 Claims**

1. A process for producing a polyethylene extruded foam, which comprises melting and kneading with a foaming agent, an ethylene-α-olefin copolymer having a density of 0.920 to 0.940 g/cm^3, a melt-flow rate of 0.3 to 10 g/10 minutes and a relationship of Mw/Mn greater than or equal to 4 between a weight average molecular weight Mw and a number average molecular weight Mn, and extruding and foaming it.

4,649,002

SYSTEM FOR PREVENTING DECOMPOSITION OF SILICON CARBIDE ARTICLES DURING SINTERING

Jonathan J. Kim, Williamsville, N.Y., and Joel D. Katz, Los Alamos, N. Mex., assignors to Kennecott Corporation, Cleveland, Ohio

Filed Apr. 1, 1985, Ser. No. 718,374

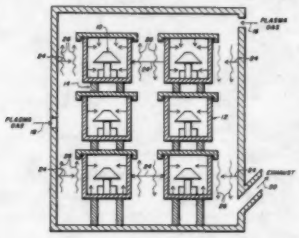
Int. Cl.[4] F27B *9/04*

U.S. Cl. 264—58 **37 Claims**

1. A method for preventing, halting, retarding or reversing

the decomposition of silicon carbide articles during high temperature sintering in a plasma furnace comprising:

placing formed silicon carbide articles into at least one covered crucible within a plasma furnace; and



sintering said silicon carbide articles in a plasma gas environment so that a partial pressure of silicon gas builds up within the closed environment rendered by the covered crucible, thereby saturating the environment with silicon gas and other silicon vapor species, halting further decomposition of said silicon carbide articles.

4,649,003

METHOD FOR PRODUCING AN INORGANIC SINTERED BODY

Tadanori Hashimoto; Masaaki Hama, both of Osaka, and Osamu Kobayashi, Chiba, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 460,513, Jan. 24, 1983, abandoned. This application Mar. 18, 1985, Ser. No. 712,925

Int. Cl.⁴ C04B *35/64*

U.S. Cl. 264—63 **2 Claims**

1. A method for producing a translucent alumina sintered body used in illumination tubes for discharge lamps comprising subjecting a mixture of (1) an aluminum oxide powder having an average particle size of not more than 20 μm and a purity of 99.9% or more and (2) a composition as a binder consisting essentially of (a) about 16.6 to 90% a higher fatty acid with (b) about 10 to 83.4%, based on the total weight of the composition, of an oxidized wax having an acid value of 1 to 80 mg-KOH/g prepared by oxidizing a linear hydrocarbon having an average of 17 to 40 carbon atoms or a branched hydrocarbon having an average of 30 to 150 carbon atoms

to extrusion molding to obtain a molded body, said molded body comprising 15 to 60% by volume of said binder, and then sintering the molded body.

4,649,004

PROCESS FOR PRODUCTION OF MULTI-LAYER PIPES FOR DRAW-FORMING

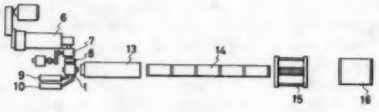
Shigezo Nohara; Takeshi Sugimoto, both of Yokohama; Kozaburo Sakano, Kawasaki; Yoshimichi Ohkubo, Fujisawa, and Junichi Matsuo, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Dec. 26, 1984, Ser. No. 686,507

Claims priority, application Japan, Dec. 27, 1983, 58-244647; Jan. 12, 1984, 59-2707

Int. Cl.⁴ B29C *47/88*

U.S. Cl. 264—85 **7 Claims**



1. A process for the production of a multi-layer pipe to be used for formation of a bottle by draw-blow-forming, which comprises forming by co-extrusion a pipe comprising inner and outer layers of polyester composed mainly of ethylene terephthalate units and an intermediate layer of oxygen-barrier resin interposed between the inner and outer layers, if necessary with an adhesive resin layer interposed between every two adjacent layers, sizing the co-extruded multi-layer pipe in the molten state so that the diameter of the pipe is uniform, and cooling the outer portion of the molten multi-layer pipe by contact with water and simultaneously introducing an inert gas containing a water mist into the interior of the pipe to thereby cool the inner portion of the pipe and prevent oxidation in the pipe without crystallization, thereby forming a solidified pipe wherein both of the outer portion and the inner portion thereof are maintained in an amorphous state.

4,649,005

METHOD FOR PRODUCING A LIQUID SILICONE RUBBER BASE

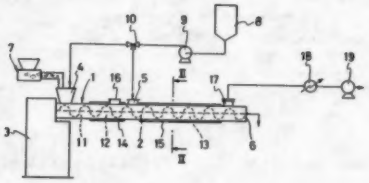
Masaru Kobayashi; Hironobu Koyanagi, and Takahiro Sato, all of Chiba, Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan

Filed Jul. 12, 1985, Ser. No. 754,492

Claims priority, application Japan, Jul. 31, 1984, 59-160398

Int. Cl.⁴ B29B *7/48, 7/84*

U.S. Cl. 264—101 **7 Claims**



1. A method for producing a filled liquid silicone rubber base in the absence of a plasticizer where said base consists essentially of a polyorganosiloxane having at least two silicon-bonded alkenyl groups per molecule and an inorganic filler, said method consisting essentially of passing all of said filler together with from 30 to 100 percent of the total weight of said polyorganosiloxane through a first kneading section of a twin screw compounding extruder to form a mixture, adding any remaining portion of said polyorganosiloxane to said mixture prior to passing it through a second kneading section of said extruder and discharging the resultant base from said extruder, where the temperatures of said first and second kneading sections are maintained at from 200° to 300° C.

4,649,006

PROCESS FOR COMPRESSION MOLDING OF SECTIONS WITH A CONSTANT CROSS-SECTION CONSISTING OF VEGETABLE PARTICLES

Anton Heggenstaller, Mühlenstr. 9, 8891 Unterbernbach, Fed. Rep. of Germany

PCT No. PCT/EP84/00040, § 371 Date Nov. 1, 1984, § 102(e) Date Nov. 1, 1984, PCT Pub. No. WO84/03472, PCT Pub. Date Sep. 13, 1984

PCT Filed Feb. 20, 1984, Ser. No. 673,755

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1983, 3307557.

Int. Cl.⁴ D04H *1/16*

U.S. Cl. 264—120 **7 Claims**

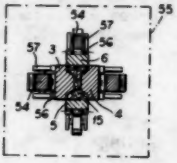
1. A method of compression molding an elongate body from particles of vegetable matter and a thermally curable binder, said method comprising the steps of:

(a) metering a mixture of said particles with said binder into a chamber to form an elongate blank;

(b) subjecting said blank at a pressing station to compression

between a first set of molding jaws which engage said elongate blank over its entire length and completely enclose said blank around the periphery thereof, thereby to impact a desired shape to said blank conforming to the intended final shape of the compression-molded body;

(c) transferring the compressed blank and said first set of molding jaws surrounding and compressing same as a unit and without relaxation of the pressing forces to a curing station at a location spaced from the location of said pressing station so that another blank can be subjected at said



pressing station to compression by another set of molding jaws advanced to said pressing station;

(d) subjecting the compressed blank while the same is still within the confines of said first set of molding jaws and under the pressing forces thereof to heat at said curing station for curing the compressed blank and transforming it into a compression-molded body; and

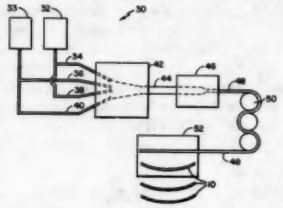
(e) thereafter spreading said molding jaws of said first set to release the resulting compression-molded body, and discharging said compression-molded body from within the first set of molding jaws.

4,649,007

COEXTRUDED MULTIPLE PLASTIC LAYER SLIP PALLET

Laszlo J. Bonis, Swampscott; George V. Courville, Watertown, and Samuel Opland, Newton Centre, all of Mass., assignors to Composite Container Corporation, Medford, Mass.

Filed Apr. 4, 1984, Ser. No. 596,541
Int. Cl.⁴ B29C *47/06, 65/66;* **B65D** *19/00, 19/36*
U.S. Cl. 264—148 **8 Claims**



1. A method of making slip pallets comprising coextruding a sheet comprising a plurality of plastic layers including an upper nonslip layer of a first plastic and a lower slip layer of second plastic, the exposed upper surface of said upper nonslip layer having a coefficient of friction higher than that of an exposed lower surface of said lower slip layer, to cause said lower surface to slide relative to a platen and said upper surface to frictionally engage boxes on it, one layer of said plurality of layers having more shrinkage than a layer below said one layer to provide a natural curl to gripping edge portions of said slip pallets such that in use said gripping edge portions of said slip pallets are accessible by a gripper of a forklift, and cutting said sheet into individual slip pallets that are larger than the boxes to be supported to provide said gripping edge portions.

4,649,008

METHOD OF MAKING INTERLOCKING VINYL SIDING

Thomas O. Johnstone, Cortland, Ohio, and Thomas W. Dawe, Clark, N.J., assignors to Alcan Aluminum Corp., Cleveland, Ohio

Filed Feb. 16, 1984, Ser. No. 580,569
Int. Cl.⁴ B29C *53/04*
U.S. Cl. 264—177.1 **11 Claims**

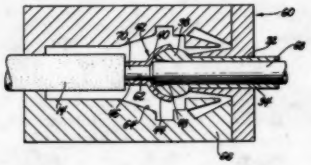
1. A method of forming a vinyl sliding member having first and second locking profiles dimensioned so that the first locking profile can have a snap-fit interlock with the second locking profile on a similar siding member when said siding members are installed in parallel relation on a building, comprising the steps of extruding a sheet of vinyl with a first bent portion adjacent one of its edges and a second bent portion intermediate its edges, and thereafter forming the extruded sheet of vinyl into a siding profile, the forming of the extruded sheet of vinyl into the siding profile including the steps of (i) bending the end of the extruded sheet of vinyl having the first bent portion into a first locking profile which incorporates the first bent portion and (ii) bending the intermediate portion of the sheet of vinyl having the second bent portion into a second locking profile which incorporates the second bent portion, the second locking profile being dimensioned to have a snap-fit interlock with the first locking profile of a similarly formed siding member which interlock is provided by contact between said first bent portion and said second bent portion during installation.

4,649,009

PROCESS FOR PRODUCING A HEAT-SHRINKABLE POLYPROPYLENE FILM

Kizo Shibata, and Kazuo Dodo, both of Nagahama, Japan, assignors to Mitsubishi Plastics Industries, Limited, Tokyo, Japan

Filed Aug. 7, 1985, Ser. No. 763,251
Claims priority, application Japan, Aug. 13, 1984, 59-169026
Int. Cl.⁴ B29C *55/14*
U.S. Cl. 264—235.8 **6 Claims**



1. A process for producing a heat-shrinkable polypropylene film having balanced physical strength in both the longitudinal and transverse directions and having substantial heat shrinkability only in one direction, which comprises stretching a film of a polypropylene resin firstly in one direction, then heat-treating it at a temperature within a range of less than the melting point of the resin and not less than 30° C. below the melting point of the resin, and higher than the temperature for the first stretching, and further stretching it in a direction perpendicular to the direction of the first stretching at a temperature lower than the temperature for the heat-treatment by at least 10° C.

4,649,010

METHOD OF MAKING A REMOTE CONTROL ASSEMBLY (SWIVEL INSERT)

William G. Bennett, Troy, and Arthur L. Spease, Livonia, both of Mich., assignors to Teleflex Incorporated, Limerick, Pa.

Continuation-in-part of Ser. No. 409,495, Aug. 19, 1982, abandoned, which is a division of Ser. No. 170,888, Jul. 21, 1980, Pat. No. 4,380,178. This application Jan. 31, 1985, Ser. No. 696,992

The portion of the term of this patent subsequent to Sep. 7, 1999, has been disclaimed.

Int. Cl.[4] B29D *31/00*

U.S. Cl. 264—242 5 Claims

1. A method of making a motion transmitting remote control assembly (10) of the type including a conduit (14) with an end fitting (16) of organic polymeric material disposed on one end of the conduit (14) and a motion transmitting core element (12) extending through the conduit (14) and end fitting (16) with the core element (12) connected to a rod (24) movably supported in a bore (34) in a swivel tube (32), the bore (34) being conical and tapering from a large diameter from the front end (40) thereof to a small diameter and having a male swivel portion (38) with a partial convex spherical surface extending from its intersection with the exterior of the swivel tube (32) to the front end face (40) thereof and pivotally supported in a female swivel portion having a cup-shaped insert (42) disposed therein having a tubular portion (46) engaging the end of the conduit (14) and having an integral cup-shaped portion (44) engaging the male swivel portion (38) and extending at least beyond the front and end face (40) thereof, said method including the steps of; disposing the cup-shaped insert over the male swivel portion (38) and the front end (40) thereof, plugging the bore (34) of the swivel tube (32) contiguous with the passageway (62) of the tubular portion (46) of the cup-shaped insert (42) with the cup-shaped portion (44) engaging the convex surface of the male swivel portion (38) to prevent entry of material into the bore (34) past the front end face (40) thereof and to prevent entry of material into the tubular portion (46), placing the swivel tube (32) and cup-shaped insert (42) into a mold cavity (64) and injecting organic polymeric material into the cavity (64) for molding the fitting (16) about the male swivel portion (38) and the cup-shaped insert (42).

4,649,011

METHOD OF MAKING A CAM SHAFT

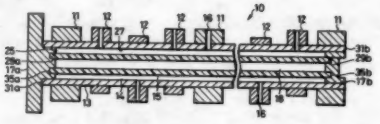
Genkichi Umeha, Tokyo; Shigeru Urano, Saitama; Osamu Hirakawa, Saitama, and Shunsuke Takegushi, Saitama, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Division of Ser. No. 691,838, Jan. 16, 1985. This application Mar. 19, 1985, Ser. No. 841,308

Claims priority, application Japan, Jan. 20, 1984, 59-7032

Int. Cl.[4] B29C *45/00*

U.S. Cl. 264—267 3 Claims



1. A method of fabricating a hollow cam shaft of the type wherein lubricating oil is distributed to the cam portions through the hollow shaft, the method comprising the steps of:

selecting a pipe member having a longitudinal axis, a through-hole along the axis, and an inner cylindrical wall;

selecting a mold having a longitudinal axis and a cylindrical mold cavity oriented along the mold axis, the outer diameter of the cavity being less than the inner diameter of the pipe member;

inserting the mold into the through-hole of the pipe member;

injecting a liquid resinous material into the mold cavity; and

withdrawing the mold after the resinous material has hardened.

4,649,012

METHOD OF SHAPING AN ELONGATED PRODUCT

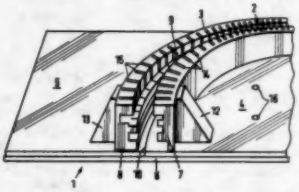
Karl H. Witte, Hilter, Fed. Rep. of Germany, assignor to Maschinen Witte KG, Hilter, Fed. Rep. of Germany

Division of Ser. No. 269,924, Jun. 2, 1981, Pat. No. 4,468,190. This application May 2, 1984, Ser. No. 606,053

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1980, 3020922; Jun. 3, 1980, 8014748[U]

Int. Cl.[4] B29C *53/00*

U.S. Cl. 264—285 1 Claim



1. A method for shaping an elongated softened plastic product into an arcuate configuration comprising the steps of mounting two elongated complementary bendable mold parts on a support means, bending said mold parts along their longitudinal axes to provide an arcuate path of said mold parts corresponding to the desired arcuate configuration of said product while disposing said two mold parts spaced from one another and providing a longitudinal free slot therebetween, and pulling said softened plastic product longitudinally through said mold parts by a drawing tool which extends through said slot as said mold parts slidingly engage said softened plastic product to thereby impart to said product an arcuate configuration corresponding to the arcuate configuration of said mold parts.

4,649,013

METHOD OF MAKING A PLASTIC CAP

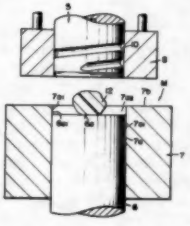
Osamu Yamamoto, Hiratsuka, and Muneki Yamada, Fujisawa, both of Japan, assignors to Toyo Seikan Kaisha, Limited, Osaka, Japan

Filed Feb. 24, 1983, Ser. No. 469,249

Claims priority, application Japan, Jul. 8, 1982, 57-117727

Int. Cl.[4] B29D *1/00*

U.S. Cl. 264—318 13 Claims



1. A method of manufacturing a plastic cap having a top end and a skirt portion hanging down from the peripheral edge of said top end, said skirt portion being provided with a thread formed on the inner surface thereof, comprising:

providing a first plunger whose lower side surface portion has a shape corresponding to the inner surface of said skirt portion and is formed with a thread groove with a shape corresponding to that of said thread and whose bottom

end surface has a shape corresponding to that of the inner surface of said top end, a second plunger whose upper end surface has a shape corresponding to that of the outer surface of said top end, a holding pad with an inner peripheral surface with a height larger than that of said thread groove as well as an inside diameter substantially equal to the outside diameter of said first plunger, and a die provided with a die cavity having an inner peripheral surface with a shape corresponding to that of the outer peripheral surface of said skirt portion;

placing a molten plastic stock onto the upper end surface of said second plunger, said upper end surface being positioned at a level such that the volume of a die cavity gap portion above said upper end surface and below the level of said upper surface of said die is substantially equal to the volume of said molten plastic stock or less;

bringing the bottom surface of said holding pad into contact with the upper surface of said die; and

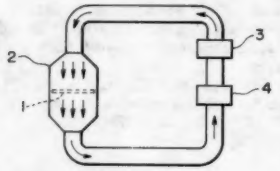
introducing said first and second plungers into said die cavity with said first plunger sliding along the inner peripheral surface of said holding pad while compressing said molten plastic stock between said first and second plungers, whereby said skirt portion is formed by the material of said plastic stock flowing out from between said first and second plungers into between said lower side surface portion of said first plunger and said inner peripheral surface of said die cavity, while at an early stage of the forming, the end surface of said skirt portion is defined by a projecting portion of the bottom surface of said holding pad above said die cavity.

4,649,014

MOLDED ARTICLES OF NONWOVEN FABRIC CONTAINING SYNTHETIC FIBER AND PROCESS FOR PRODUCING THE SAME

Kiyoshi Tochikawa, Tokyo, Japan, assignor to Midori C.M.B. Co., Ltd., Saitama, Japan

Filed Jun. 3, 1985, Ser. No. 740,543
Claims priority, application Japan, Jan. 18, 1985, 35-6793
Int. Cl.[4] B29C *39/14*
U.S. Cl. 264—555 **1 Claim**



1. A process of making a nonwoven fabric finished material useful as a sole for footwear, consisting of the steps of

(a) blending a material selected from the group consisting of polypropylene noil, acrylic noil, polyester noil, motley noil, with a conductive material selected from the group consisting of carbon fibers, metallized glass fibers, copper-surface acrylic fibers and mixtures thereof, the conductive material being blended with the noil material in a ratio of about 1% to about 10%, by weight of the entire composition to form a nonwoven workpiece having a thickness of about 13 mm;

(b) placing said workpiece in a hot-air drying zone so as to pass hot air through the workpiece at a heat of about 170° C. to about 220° C. at which temperature range the workpiece is melted;

(c) compressing said workpiece under pressure of about 50 to about 200 kg/cm^2 while rapidly cooling the workpiece and molding the workpiece to form a plate of a thickness of about 3 mm; and,

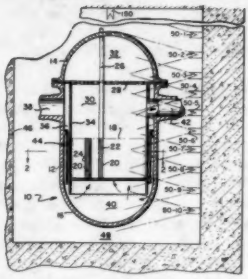
(d) cutting the workpiece into a desired shape with a cutting die.

4,649,015

MONITORING SYSTEM FOR A LIQUID-COOLED NUCLEAR FISSION REACTOR

Alexander DeVolpi, Bolingbrook, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 20, 1984, Ser. No. 632,743
Int. Cl.[4] G21C *17/00*
U.S. Cl. 376—258 **16 Claims**



1. For use with a fission reactor having a pressure vessel, a core in the pressure vessel, means for generating fission reaction heat in the core, and means including a coolant circulating under pressure through the reactor vessel and core for transmitting said heat to outside of the reactor for external conversion to useful work, improved monitoring means for determining the level of the coolant at various regions in the reactor vessel, comprising the combination of a plurality of gamma radiation detectors; means for positioning the radiation detectors adjacent the reactor vessel on the exterior side thereof, said radiation detectors being vertically spaced apart over the reactor vessel and said detectors being arranged in at least two sets, wherein each set of detectors is orientated radially to span different radially adjacent regions in the reactor to the exclusion primarily of the other sets; means for collimating each of the detectors to admit gamma radiation energy only along a limited substantially straight beam path, and means for detecting changes in the signals of the respective detectors and for apprising the corresponding changes in the level and density of the water proximate thereto.

4,649,016

REMOTELY OPERABLE FUEL TRANSFER SYSTEM FOR NUCLEAR REACTOR

Roy T. Hardin, Jr., Unity Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 9, 1985, Ser. No. 785,814
Int. Cl.[4] G21C *19/20, 19/18;* E05F *11/00*
U.S. Cl. 376—261 **17 Claims**

1. A fuel transfer system for transferring fuel assemblies through a transfer tube extending between, and having respective ends thereof disposed in, corresponding fuel assembly exchange locations of a fuel storage and handling building and a containment structure for a nuclear reactor, wherein corresponding valves disposed at said ends of said transfer tube are remotely, selectively operable to a closed position for sealing same during normal operation of the reactor and to an open position to permit transfer of fuel therethrough during fuel exchange operations, comprising:

a segmented track comprising first, second and third track segments supported in aligned relationship at fixed posi-

tions respectively in said fuel storage and handling building, said transfer tube, and said containment structure;

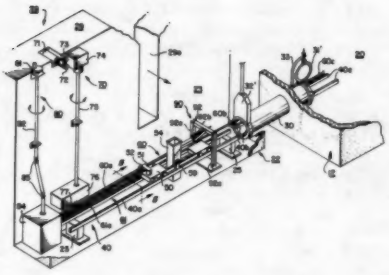
transport means for receiving at least one fuel assembly, said transport means being supported on said segmented track and moveable therealong for transporting a received fuel assembly between said fuel exchange locations;

a segmented drive screw comprising first, second and third drive screw segments associated respectively with said fuel storage and handling building, said transfer tube, and said containment structure;

first, second and third mounting means within said fuel storage and handling building, said transfer tube, and said containment structure, respectively, for rotatably mounting said respective first, second and third drive screw segments in axially aligned relationship and normally displaced from one another to define gaps between the adjacent ones of said first and second drive screw segments and said second and third drive screw segments at positions respectively corresponding to the ends of said transfer tube for accommodating closure of said valves at said ends of said transfer tube;

each of said first and second mounting means permitting linear movement of said corresponding first and second drive screw segments along said aligned axes thereof;

first corresponding mating engagement means on the respective, adjacent ends of said first and second drive screw



segments and second corresponding mating engagement means on the respective, adjacent ends of said second and third drive screw segments;

rotary drive means for rotating said first drive screw segment selectively in clockwise and counterclockwise directions about said aligned axis thereof;

linear drive means for selectively, linearly moving said first drive screw segment toward said second drive screw segment to bring said corresponding mating engagement means of said first and second drive screw segments into engagement and, in succession, to linearly move said engaged first and second drive screw segments toward said third drive screw segment to bring said corresponding mating engagement means of said second and third drive screw segments into engagement, said first, second and third drive screw segments thereby being interengaged for common rotation;

follower means received in threaded relationship on said segmented drive screw and moveable linearly therealong in first and second, opposite axial directions in accordance with the respective clockwise and counterclockwise directions of rotation thereof; and

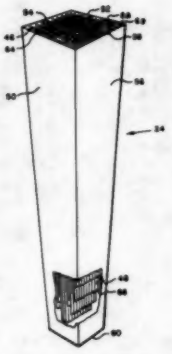
means connecting said follower means to said fuel transport means for correspondingly moving said fuel transport means along said segmented track selectively from one of said fuel exchange locations and through said transfer tube to the other of said fuel exchange locations.

4,649,017

NUCLEAR FUEL ROD TRANSFER CANISTER HAVING CORRUGATED FUNNEL

Michael V. Couture, Holyoke, Mass., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 24, 1984, Ser. No. 686,171
Int. Cl.[4] G21C *19/32*
U.S. Cl. 376—272 **6 Claims**



1. A nuclear fuel rod consolidation canister for the consolidation of nuclear fuel rods, comprising:

an elongated, tapered box of generally rectangular cross-section having upper and lower internal sections;

the upper section having grid means for receiving individual fuel rods in a relatively loosely packed rectangular array of rows and columns, and for urging the rods closer together as they are lowered into the box, such that the rods emerge through the lower end of the upper section in a relatively tightly packed rectangular array;

the lower section being adapted to receive the rods as they emerge from the upper section, and having a plurality of substantially vertical plate members corresponding to the number of columns of fuel rods in said upper section;

each plate having substantially parallel upper and lower edges, inwardly tapered side edges abutting the box, and a plurality of integrally formed, corrugated channels corresponding to the number of rows of fuel rods, the corrugations extending to the lower edges of each plate and forming a periodic series of converging alternating convex and concave arches;

wherein each plate is aligned with an adjacent plate such that each convex arch on one plate faces a concave arch on an adjacent plate, and each concave arch on said one plate faces a convex arch on said adjacent plate;

whereby the leading ends of the tightly packed rectangular array of fuel rods received by the lower section are consolidated between the plates and box, into a tightly packed triangular array at the lower edges of the plates.

4,649,018

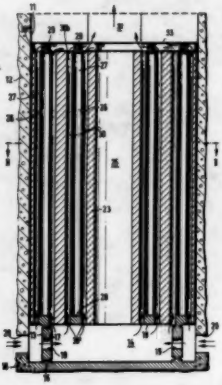
CONTAINER FOR THE STORAGE OF RADIOACTIVE ELEMENTS

Klaus P. Waltersdorf, Rösrath, and Volker Hansson, Cologne, both of Fed. Rep. of Germany, assignors to Strabag Bau-AG, Cologne, Fed. Rep. of Germany

Filed Mar. 9, 1984, Ser. No. 587,916
Int. Cl.[4] G21C *19/00*
U.S. Cl. 376—272 **19 Claims**

1. A container for storing radioactive elements comprising a heat resistant, reinforced concrete block, said block having a plurality of horizontally spaced, elongated storage chambers extending vertically therein, each of said chambers being closely surrounded by a plurality of cooling ducts extending

through said block, said ducts being generally parallel to said chambers and connected at one end to an air supply, and at the other end to an air discharge, said air supply being fed by



natural convection from the atmosphere at said container, said cooling ducts thereby completing a convective air flow path from the atmosphere of said container through said air supply and said ducts to said air discharge.

4,649,019

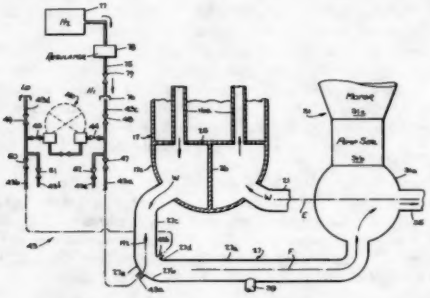
DRAINING DOWN OF A NUCLEAR STEAM GENERATING SYSTEM

John C. Jawor, 69 Phillips St., Beacon, N.Y. 12508

Continuation of Ser. No. 537,355, Sep. 29, 1983, abandoned. This application Jun. 6, 1986, Ser. No. 873,145

Int. Cl.[4] F16F *1/34*

U.S. Cl. 376—316 **14 Claims**



1. The method of draining down contained reactor-coolant water from the inverted vertical U-tubes of a vertical-type steam generator in which the upper, inverted U-shaped ends of said tubes are closed and the lower ends thereof are open, said steam generator being part of a nuclear powered steam generating system wherein said reactor coolant water is normally circulated from and back into the reactor via a loop comprising said steam generator and inlet and outlet conduits connected to the lower end of said steam generator, said method comprising the steps of continuously introducing a gas which is inert to the system and which is under pressure above atmospheric pressure into at least one of the downwardly facing open ends of each of said U-tubes from below the tube sheet in which the open ends of said U-tubes are mounted adjacent the lower end of said steam generator, while permitting said water to flow out from said open ends of the U-tubes.

4,649,020

NUCLEAR FUEL ASSEMBLY AND NUCLEAR REACTOR OPERATING PROCESS COMPRISING APPLICATION THEREOF

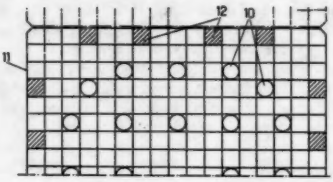
Claude Dehon, Oullins, and André Kolmayer, Lyons, both of France, assignors to Fragema, Courbevoie, France

Filed Feb. 22, 1985, Ser. No. 704,221

Claims priority, application France, Feb. 22, 1984, 84 02684

Int. Cl.[4] G21C *3/00*

U.S. Cl. 376—419 **9 Claims**



1. A nuclear fuel assembly comprising a bundle of fuel elements some of which contain burnable neutronic poison and a structure for retaining said fuel elements at the nodes of a regular lattice, said structure having end pieces connected together by guide tubes occupying some of the nodes of the lattice, wherein all of said poison-containing elements are so located as to affect the reactivity of adjacent fuel assemblies when located in the core of a reactor and wherein the poison-containing elements are disposed at the nodes of the lattice furthest away from said guide tubes.

4,649,021

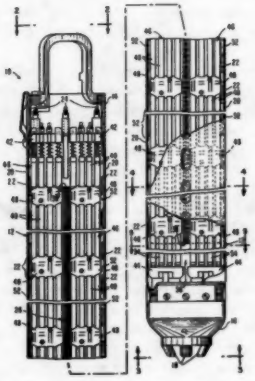
BWR FUEL ASSEMBLY WITH WATER FLOW MIXING CHAMBER AT FUEL BUNDLE/WATER CROSS ENTRANCE

Rusi P. Taleyarkhan, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 19, 1985, Ser. No. 746,619

Int. Cl.[4] G21C *3/32, 15/00*

U.S. Cl. 376—444 **7 Claims**



1. In a fuel assembly having a bundle of elongated fuel rods disposed in side-by-side relationship so as to form an array of spaced fuel rods, an outer tubular flow channel surrounding said fuel rods so as to direct flow of coolant/moderator fluid along said fuel rods, and a hollow water cross extending centrally through and interconnected with said outer flow channel so as to divide said channel into separate compartments and

said bundle of fuel rods into a plurality of mini-bundles thereof being disposed in said respective compartments, the improvement which comprises:

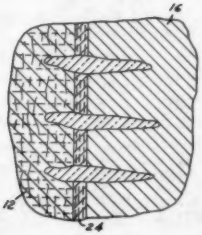
means defining a flow mixing chamber within and between lower end portions of said mini-bundles of fuel rods and below said water cross which allows free mixing cross flow within and between said lower end portions of said respective mini-bundles, said mixing chamber defining means including an upper limit constituted by a lower end of said water cross and a lower limit constituted by lower ends of said respective mini-bundles, said water cross lower end being spaced within the range of about six to twelve inches above said mini-bundle lower ends.

4,649,022

METHOD OF MAKING A CURRENT COLLECTOR FOR A SODIUM/SULFUR BATTERY

Ragnar P. Tischer, Birmingham; Walter L. Winterbottom, Farmington Hills, and Halina S. Wroblowa, West Bloomfield, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 23, 1984, Ser. No. 602,796
Int. Cl.[4] B22F *3/00, 3/02*
U.S. Cl. 419—24 **1 Claim**



1. A method of making a current collector for a sodium/sulfur battery, which current collector is electronically conductive and resistant to corrosive attack by sodium/polysulfide melts, which method comprises the step of:

forming said current collector for said sodium/sulfur battery from an evenly dispersed microscopic composite material formed of 70–90% by volume of aluminum filled with 30–10% by volume of electronically conductive fibers selected from the group of fibers consisting essentially of graphite fibers having a diameter up to 10 microns and silicon carbide fibers having a diameter in a range of 500–1000 angstroms; and

treating said current collector after formation thereof so as to remove aluminum from surfaces thereof to be in contact with sodium/polysulfide melts, whereby surface ones of said electronically conductive ceramic fibers extend outwardly from said surfaces into said sodium/polysulfide melts and an aluminum sulfide surface coating can form on said aluminum between adjacent ones of said electronically conductive ceramic fibers when said sodium/sulfur battery formed using said current collector is in operation.

4,649,023

PROCESS FOR FABRICATING A ZIRCONIUM-NIOBIUM ALLOY AND ARTICLES RESULTING THEREFROM

George P. Sabol, Murrysville Boro, and Samuel G. McDonald, III, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

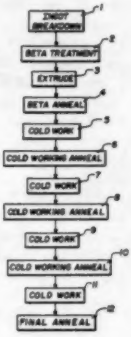
Filed Jan. 22, 1985, Ser. No. 693,547
Int. Cl.[4] C22C *16/00*
U.S. Cl. 420—422 **24 Claims**

13. An article of manufacture for use in the elevated temperature aqueous environment of a water reactor, said article comprising:

a zirconium alloy comprising said article and consisting essentially of:

0.5 to 2.0 weight percent niobium,

0.9 to 1.5 weight percent tin,



0.09 to 0.11 weight percent of a third alloying element selected from the group consisting of iron, chromium, molybdenum, vanadium, copper, nickel and tungsten,

and the balance of said alloy essentially zirconium;

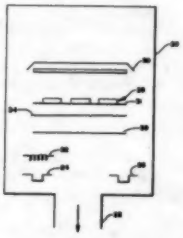
a microstructure of precipitates homogeneously dispersed throughout the matrix of said zirconium alloy, said precipitates having an average particle size below 800 angstroms.

4,649,024

METHOD FOR FORMING EVAPORATED PNICTIDE AND ALKALI METAL POLYPNICTIDE FILMS

David G. Brock, Mt. Kisco, and John A. Baumann, Ossining, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 509,159, Jun. 29, 1983. This application Feb. 17, 1984, Ser. No. 581,139
The portion of the term of this patent subsequent to Jun. 24, 2003, has been disclaimed.
Int. Cl.[4] B05D *5/12*
U.S. Cl. 427—82 **14 Claims**



1. The method of forming an evaporated film comprising a pnictide including the steps of supplying a continuous source of $Pnictide_4$ vapor species, cracking said vapor species into $Pnictide_2$ molecules, preventing the recombination of said $Pnictide_2$ molecules, and depositing said $Pnictide_2$ molecules as a film on said substrate.

4,649,025

ANTI-CORROSION COMPOSITION

Chih M. Hwa, Palatine, and Wayne A. Mitchell, Crystal Lake, both of Ill., assignors to W. R. Grace & Co., New York, N.Y.

Filed Sep. 16, 1985, Ser. No. 776,311
Int. Cl.[4] C23F 11/16
U.S. Cl. 422—15 11 Claims

1. In a method of inhibiting corrosion in an aqueous system using at least one compound selected from the group consisting of hydroxyphosphonoacetic acid and its water-soluble salts, an improvement which comprises maintaining in the aqueous system at least one compound selected from the group consisting of hydroxyethylidene-1,1-diphosphonic acid and its water-soluble salts such that the amount of said hydroxyethylidene-1,1-diphosphonic acid component in the system is about equal to the amount of said hydroxyphosphonoacetic acid component in the system; maintaining in the aqueous system at least one azole such that the amount of azole component is about 10 percent by weight of the combined amount of said two acid components in the system; and maintaining the combined amount of said hydroxyethylidene-1,1-diphosphonic acid component and said hydroxyphosphonoacetic acid component in the system between 5 ppm and 200 ppm, to provide a mixture which significantly improves the protection of ferrous metals in the aqueous system.

7. Composition for inhibiting corrosion of ferrous metal by aqueous liquid consisting essentially of at least one compound selected from the group consisting of hydroxyphosphonoacetic acid and its water-soluble salts, at least one compound selected from the group consisting of hydroxyethylidene-1,1-diphosphonic acid, and an azole; the amounts of said hydroxyphosphonoacetic acid component and said hydroxyethylidene-1,1-diphosphonic acid component being about equal; and the amount of azole component being about 10 percent by weight of the combined amount of said two acid components.

4,649,026

DIAGNOSTIC STRIPS

Stephen R. Postle, Wilmslow; Peter J. Elton, Macclesfield, and David P. Gregory, Wilmslow, all of England, assignors to Ciba-Geigy AG, Basle, Switzerland

Filed Nov. 8, 1985, Ser. No. 796,346
Claims priority, application United Kingdom, Nov. 15, 1984, 8428876
Int. Cl.[4] G01N 1/48, 21/06; B01D 13/02; C25D 13/00
U.S. Cl. 422—56 14 Claims

1. a method of preparing a diagnostic strip coated with agarose which comprises preparing a roll of web material so that an aqueous silver halide emulsion can adhere thereto on one side thereof, but which does not have a gelatin or any other proteinous layer on the prepared side then coating on the prepared side of the web by a continuous web coating method a layer of an aqueous agarose solution at a temperature of at least 40° C., drying the coated agarose layer to provide a dried layer thickness of from 0.1 to 100 μm which is dry to touch, but which comprises 10 to 50% w/w solids and cutting the coated web into strips of the required size.

14. A diagnostic strip coated with agarose when prepared by the method claimed in claim 1.

4,649,027

BREATH TESTER

Douglas C. Talbot, Vail, Colo., assignor to CMI, Inc., Minturn, Colo.

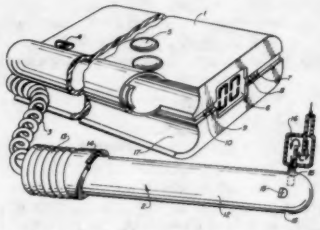
Filed Jan. 29, 1985, Ser. No. 696,060
Int. Cl.[4] G01N 21/35
U.S. Cl. 422—84 25 Claims

1. A breath tester which comprises:

a housing defining a sleeve adapted for receiving a wand;

a wand defining an internal sample chamber for receiving a sample, a lamp within the wand for providing infrared energy, and a detector in the wand for receiving the infrared energy after it has passed through the sample to be tested;

means for purging gas from said internal sample chamber, said purging means comprising means defining a pair of spaced apart openings located in a main portion of the wand and extending therethrough whereby said internal



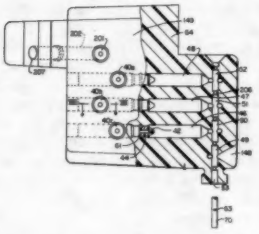
sample chamber communicates with the environment outside of the wand, said wand having an external shape to provide a snug fit within the sleeve whereby movement of said wand within said sleeve creates necessary pressures and vacuums required to purge gas from said sample chamber without a mechanical pump.

4,649,028

ELECTROLYTE ANALYZER

Karl W. Kaltenbach, Newtonville; Stephen Rettew, Newton; John O. Rudy, Cambridge, all of Mass., and Gabor L. Szakacs, Nashua, N.H., assignors to Medica Corporation, Bedford, Mass.

Filed Mar. 27, 1985, Ser. No. 716,670
Int. Cl.[4] B01L 3/00, 3/02; G01N 35/08, 37/00
U.S. Cl. 422—100 5 Claims



1. A fluid selecting system with a disposable reagent pack comprising:

a. a fluid selector valve having a plurality of input channels arranged in a predetermined geometric pattern, an output channel and means for sequentially connecting any input channel to the output channel;

b. a container pack containing a plurality of flexible pouches for containing reagents, each pouch having an opening containing a fitment sealed to the pouch and in fluid communication with a reagent contained in the pouch, the pouches being disposed in the reagent pack with their fitments in juxtaposition,

the contAiner pack having an opening in its perimeter containing and holding in place the juxtapositioned fitments, the fitments each having a fluid connector compatible in size and engagable with an input channel in the selector valve, the connectors extending outwardly from the container pack and arranged in the same predetermined geometric pattern as the input channels in the selector valve, whereby the container pack can be plugged into, and un-

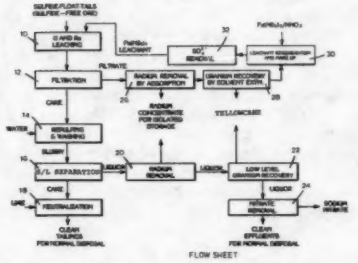
plugged from the selector valve so that each pouch in the reagent pack is in fluid communication with an input channel in the selector valve.

4,649,029

PROCESSES FOR EXTRACTION OF URANIUM AND RADIUM FROM URANIUM-CONTAINING ORES USING FERRIC NITRATE

Inderjit Nirdosh, 494 Ryerson Crescent, Thunder Bay, Ontario, Canada (P7C 5R8)

Filed Apr. 13, 1984, Ser. No. 599,896
Int. Cl.[4] C01G *43/00*; C01F *13/00*
U.S. Cl. 423—8 **11 Claims**



FLOW SHEET

1. A process for the extraction of both uranium and radium from uranium ores in the presence of an interfering sulfate ion resulting from the presence of sulfide therein by use of an aqueous ferric nitrate leachant including the steps of:

(a) mechanically treating the finely ground ore for the removal of sulfide therefrom;

(b) leaching the mechanically treated finely ground ore with aqueous acidic ferric nitrate solution in a concentration from 0.01 to 0.1M for the removal of uranium and radium therefrom to result in a liquid ferric nitrate leachate containing radium and uranium and a wet cake containing radium, uranium and ferric nitrate;

(c) treating the ferric nitrate leachate to separate uranium and radium therefrom;

(d) separately treating the wet cake for removal of retained ferric nitrate and the residual radium and uranium therefrom; and

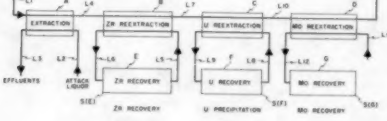
(e) recirculating a major portion of the ferric nitrate leachate from step (c) for the leaching of more of the mechanically treated finely ground ore.

4,649,030

PROCESS FOR THE PURIFICATION OF URANIFEROUS AND/OR MOLYBENDIFEROUS AMINO ORGANIC SOLUTIONS WHICH CONTAIN ZIRCONIUM AND/OR HAFNIUM AMONG OTHER IMPURITIES

Philippe Joubert, Lyons, France, assignor to Uranium Pechiney, France

Filed Jun. 1, 1984, Ser. No. 616,537
Claims priority, application France, Jun. 7, 1983, 83 09934
Int. Cl.[4] C01G *43/00, 39/00, 25/00, 27/00*
U.S. Cl. 423—9 **15 Claims**



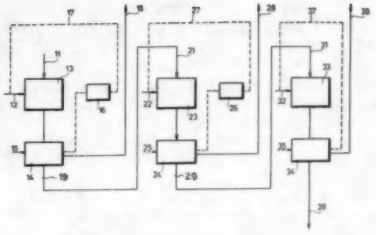
1. In a process for the selective separation of uranium and/or molybdenum from zirconium and/or hafnium contained in a sulfuric liquor resulting from the acid attack of uraniferous ores, which comprises extracting the uranium and/or molybdenum, and zirconium and/or hafnium from the acid attack liquor by means of an amino organic solution, the improvement which comprises reextracting the zirconium and/or hafnium from the amino organic solution by contacting said amino solution with an aqueous sulfuric reextraction solution containing sulfuric acid and at least one inorganic sulfate selected from the group consisting of sodium, potassium, lithium, rubidium, cesium, thallium and ammonium sulfates to obtain a zirconium and/or hafnium charged aqueous phase and a uranium and/or molybdenum rich organic phase, and separating the zirconium and/or hafnium charged aqueous phase from the uranium and/or molybdenum rich organic phase to obtain an organic phase substantially free from zirconium and/or hafnium impurities.

4,649,031

PROCESS FOR RECOVERING RARE METALS FROM THE COMBUSTION RESIDUE OF COAL BY DIGESTION

Béla Mátyás; Pál Gerber; András Solymos; Ferenc Kaszanitzky, all of Tatabánya; Gyorgy Panto, and Janos Leffler, both of Budapest, all of Hungary, assignors to Tatabányai Szénbányák, Tatabanya, Hungary

Filed Nov. 9, 1981, Ser. No. 319,189
Claims priority, application Hungary, Nov. 14, 1980, 2723/80
Int. Cl.[4] C22B *60/02*; B01F *1/00*; C01G *43/00*; C01F *1/00*
U.S. Cl. 423—20 **8 Claims**



1. A non-destructive digestion process for recovering metals of Groups V/b and VI/b of the Periodic Table and the lanthanides and actinides adsorbed on the surface of the combustion residues of coal comprising the separate steps of

(a) reducing the grain size of said combustion residue to from about 0.1 to about 1 mm;

(b) digesting the combustion residue with water;

(c) digesting the combustion residue with a dilute aqueous alkaline solution;

(d) digesting the combustion residue with a dilute aqueous acid solution at a temperature below the boiling point of water and continuing said acid digestion until the iron concentration abruptly increased;

(e) separating the solid and liquid phases after each digestion; and

(f) isolating the said metals from the liquid phase; with the proviso that steps (b), (c) and (d) can be in any order and the total digestion time is up to about 4 hours.

4,649,032

PROCESS FOR THE SELECTIVE REMOVAL OF HYDROGEN SULFIDE FROM GASEOUS STREAMS

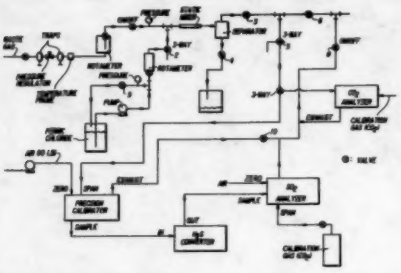
Earl S. Snavely, Jr., Arlington, and Timothy A. Jones, Carrollton, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 361,947, Mar. 25, 1982, abandoned, which is a continuation-in-part of Ser. No. 336,796, Jan. 4, 1982, abandoned. This application Jan. 11, 1985, Ser. No. 690,545

The portion of the term of this patent subsequent to Feb. 12, 2002, has been disclaimed.

Int. Cl.[4] C01B *17/16*

U.S. Cl. 423—226 61 Claims



1. A process for the selective removal of hydrogen sulfide from a gaseous stream, additionally containing carbon dioxide, by contacting the gaseous stream with a polyvalent metal chelate solution, wherein the pH of said polyvalent metal chelate solution is greater than 7 and is constant because the net absorption-desorption of said carbon dioxide in said solution is zero, said contacting being for a time sufficient to allow the polyvalent metal chelate solution to oxidize the hydrogen sulfide to elemental sulfur precipitate.

4,649,033

PROCESS TO ELIMINATE AIR POLLUTANTS WHICH RESULT FROM THE COMBUSTION OF FUELS CONTAINING SULPHUR

Newton C. Ladeira; Paulo R. M. De Oliveria; Adilson P. Marante, and Pedro A. Krepel, all of Sao Paulo, Brazil, assignors to K,L+M Industria E Comercio S/P, Brazil

PCT No. PCT/BR83/00007, § 371 Date Apr. 20, 1984, § 102(e) Date Apr. 20, 1984, PCT Pub. No. WO84/00903, PCT Pub. Date Mar. 15, 1984

PCT Filed Aug. 25, 1983, Ser. No. 610,998

Claims priority, application Brazil, Aug. 26, 1982, 8205030; Aug. 16, 1983, 8304413

Int. Cl.[4] C01B *17/00*

U.S. Cl. 423—242 8 Claims

1. A process for eliminating air pollutants in the form of sulfur dioxide and sulfur trioxide resulting from the combustion of sulphur bearing fuels and for producing a liquid consisting essentially of ammonium sulphate as a useful commercial end-product, which comprises the following steps:

providing at least one injection of Ammonia into combustion gases which are at a temperature of 250° C. to 600° C., the Ammonia being injected in sufficient quantity to transform, into Ammonium Sulphate, substantially all the existing SO_3 and SO_2 produced by the combustion of these fuels, a portion of the injected Ammonia reacting with substantially all of said SO_3 to produce Ammonium Sulphate, the remainder of said Ammonia intermixing with said combustion gases;

cooling the combustion gases having intermixed Ammonia to a temperature lower than 65° C. in the presence of air, whereby at least a portion of the remaining Ammonia reacts with substantially all of said SO_2 to produce ammonium sulfite which is simultaneously oxidized to produce Ammonium Sulphate;

passing these gases through a separation system adequate for submicron to low value micra particulates;

collecting the Ammonium Sulphate end-product from the separation system; and

releasing the desulphurized gases to the atmosphere.

4,649,034

CATALYZED FLUE GAS DESULFURIZATION

Gerald D. Rutledge, McMurray, Pa., assignor to Conoco Inc., Wilmington, Del.

Filed Jun. 14, 1985, Ser. No. 744,729

Int. Cl.[4] B01J *8/00*; C01B *17/00*

U.S. Cl. 423—244 6 Claims

1. The method of reducing sulfur dioxide content of flue gas generated by combustion of sulfur-containing fuel which comprises:

(a) passing said flue gas containing molecular oxygen at a temperature of at least about 415° C. into a first end of a vertically elongated boiler convection zone;

(b) introducing into an upper end of said boiler convection zone a shower of dry particulate oxidation catalyst, said catalyst passing through said boiler convection zone cocurrently with exiting gases;

(c) removing from a lower end of said boiler convection zone a stream comprising said oxidation catalyst;

(d) returning a portion of the removed stream of step (c) to the step of introducing in step (b);

(e) providing finely divided dry lime, quicklime, limestone or dolomite sulfur trioxide getter to said flue gas at a point proximate to said first end of said boiler convection zone; and

(f) removing from a second end of said boiler convection zone a stream comprising flue gas of diminished sulfur dioxide content carrying a suspension of finely divided reaction product of getter and sulfur trioxide.

4,649,035

PRODUCTION OF PHOSPHORUS AND PHOSPHORIC ACID

James C. Barber, Florence, Ala., assignor to James C. Barber and Associates, Inc., Florence, Ala.

Division of Ser. No. 728,620, Apr. 29, 1985, Pat. No. 4,608,241, which is a continuation-in-part of Ser. No. 503,099, Jun. 10, 1983, Pat. No. 4,619,819, which is a division of Ser. No. 428,840, Sep. 30, 1982, Pat. No. 4,451,277, which is a continuation-in-part of Ser. No. 301,378, Sep. 11, 1981, Pat. No. 4,383,847, which is a division of Ser. No. 223,122, Jan. 7, 1981, Pat. No. 4,372,929.

This application Aug. 7, 1985, Ser. No. 763,211

Int. Cl.[4] C01B *25/01*

U.S. Cl. 423—317 18 Claims

1. A process for the production of phosphoric acid comprised of the following steps:

(a) agglomerating phosphate ore by tumbling with a binder formed by reacting acidic phosphorus compounds with alkaline substances;

(b) smelting agglomerated phosphate ore in step (a) with reducing carbon and silica in a submerged-arc electric furnace;

(c) cooling gases in step (b) by contacting said gases with water;

(d) collecting mixtures of phosphorus, phosphorus sludge, and water from step (c) in a sump;

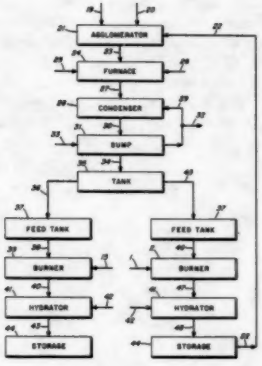
(e) separating water from mixture of phosphorus and phosphorus sludge in sump of step (d);

(f) recycling water from step (e) to step (c);

(g) bleeding off a stream of water from step (f);

(h) separating phosphorus from phosphorus sludge containing benzene insoluble materials in sump of step (d);

(i) pumping the phosphorus sludge from step (h) to a feed tank;
(j) feeding phosphorus sludge from step (i) to a burner;
(k) oxidizing phosphorus sludge from step (j) to form a mixture of phosphorus oxides containing said benzene insoluble materials and comprising P_4O, P_2O, P_2O_3, P_2O_4, P_2O_5, and P_2O_6;
(l) reacting phosphorus oxides in step (k) with water to form acidic phosphorus compounds containing said benzene insoluble materials;



PROCESS FOR MAKING PHOSPHORIC ACID

(m) pumping acidic phosphorus compounds in step (l) including said benzene insoluble materials to step (a);
(n) pumping phosphorus in step (h) to a feed tank;
(o) feeding phosphorus from step (n) to a burner;
(p) oxidizing phosphorus in step (o) to form phosphorus pentoxide;
(q) reacting phosphorus pentoxide in step (p) with water to form phosphoric acid solution; and
(r) pumping phosphoric acid solution in step (q) to product storage.

4,649,036

PROCESS FOR THE MANUFACTURE OF ZEOLITES 4A HAVING A HIGH CRYSTALLINITY AND A FINE GRANULOMETRY AND BEING PARTICULARLY SUITABLE FOR THE FORMULATION OF DETERGENT COMPOSITIONS

Fabio Pastorello, and Claudio Troglia, both of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

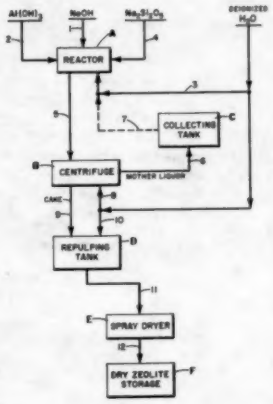
Continuation of Ser. No. 664,093, Oct. 24, 1984, abandoned, which is a continuation of Ser. No. 595,643, Apr. 2, 1984, abandoned, which is a continuation of Ser. No. 285,927, Jul. 23, 1981, abandoned, which is a continuation of Ser. No. 116,255, Jan. 28, 1980, abandoned. This application Mar. 31, 1986, Ser. No. 845,495

Claims priority, application Italy, Jan. 26, 1979, 19617 A/79

Int. Cl.⁴ C01B *33/28*

U.S. Cl. 423—328 **3 Claims**

1. A batch process for the synthesis of a zeolite 4A having a coarse fraction equal to zero, an exchange power with Mg^{++} equal to or higher than 45 mg CaO/g, and a granulometric modulation index equal to or higher than 85, wherein, in a first stage, an aqueous solution of Na silicate, in which the SiO_2:H_2O molar ratio is from 0.60 to 0.150 and the SiO_2/Na_2O molar ratio is from 1.95 to 2.30, is added to an aqueous solution of Na aluminate containing an excess of NaOH, preheated at 70°–75° C., and wherein, in a second stage, the thus-obtained mixture is crystallized at 70°–105° C., the global dilution factor, τ, being from 8 to 15, said process being characterized in that the temperature of the silicate solution is at least 20° C. lower than the temperature of the aluminate solution, the crystallization time being at least 50 minutes, whereby said silicate solution can be added within a time equal to or less than 15 minutes without using any Venturi tube or any ultra-rapid stirrer, and wherein the crystallization is subdivided into three sub-stages,



the first sub-stage being characterized by the temperature of approximately 70° C., the second sub-stage including a gradual rising of the temperature between the first and third sub-stages of from approximately 70° C. to 95°–105° C., and the third sub-stage being characterized by a temperature of from 95° to 105° C.

4,649,037

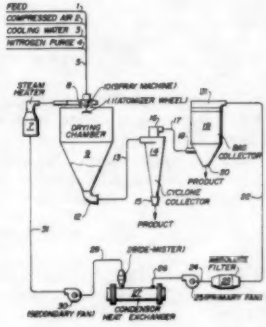
SPRAY-DRIED INORGANIC OXIDES FROM NON-AQUEOUS GELS OR SOLUTIONS

Gary B. Marsh, Pittstown; Anthony J. Fanelli, Rockaway; John N. Armor, Morris Plains, and Patrick M. Zambri, Montclair, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Mar. 29, 1985, Ser. No. 717,931

Int. Cl.⁴ C01B *33/16*

U.S. Cl. 423—338 **22 Claims**



1. A process of producing metal oxide powders which comprises:

(a) admixing reactants comprising an organic solvent, at least one hydrolyzable metal compound, and a sufficient amount of water to at least partially hydrolyze said hydrolyzable metal compound;

(b) supplying the admixture as a plurality of droplets to a heating zone operated under conditions of temperature and pressure below the critical temperature and pressure of the reactants but sufficient to produce a product comprising metal oxide powders, and a gas comprising organic solvent vapors;

(c) separating said product from said gas; and,

(d) collecting the product.

4,649,038

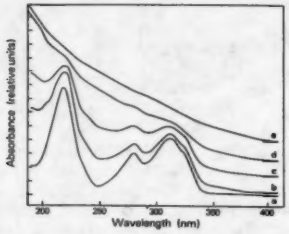
CYANOGEN POLYMERS AND PYROPOLYMERS AND FIBERS THEREOF

Mortimer M. Labes, and Jiann H. Chen, both of Philadelphia, Pa., assignors to Temple University, Philadelphia, Pa.

Continuation-in-part of Ser. No. 656,950, Oct. 10, 1984, abandoned, and a continuation-in-part of Ser. No. 710,094, Mar. 11, 1985, abandoned. This application Sep. 17, 1985, Ser. No. 775,601

Int. Cl.[4] C01B *21/06;* **C25B** *1/00;* **D01F** *9/12;* **B28B** *11/18*

U.S. Cl. 423—364 **24 Claims**



8. A polycyanogen fiber spun from a polycyanogen comprised of

units.

4,649,039

RADIOLABELING OF METHIONINE-CONTAINING PROTEINS AND PEPTIDES

Russell K. Garlick, Townsend, and Ludek Jirousek, Tewksbury, both of Mass., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 3, 1984, Ser. No. 627,644

Int. Cl.[4] A61K *43/00;* **G01N** *33/536*

U.S. Cl. 424—1.1 **11 Claims**

1. A process for the radiolabeling of methionine-containing proteins or peptides comprising the sequential steps of (i) oxidizing the proteins or peptide under mild oxidizing conditions to the sulfoxide form; (ii) radiolabeling the oxidized protein or peptide; and (iii) reducing the radiolabeled oxidized protein or peptide under mild reducing conditions.

4,649,040

THERAPY FOR RETINOID PATHOGENESIS

Josef Pitha, Baltimore, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed May 4, 1984, Ser. No. 607,160

Int. Cl.[4] A61K *31/095, 31/195*

U.S. Cl. 424—10 **5 Claims**

4. A method for ameliorating retinoid pathogenesis in mammals comprising administering to a mammal an amount of an agent as defined in claim 1 effective to ameliorate retinoid pathogenesis.

4,649,041

MAGNESIUM TRISILICATE SUITABLE FOR PREPARATION OF MEDICAMENT ADSORBATES OF ANTINAUSEANTS

David Peters, Long Valley; John Denick, Jr., Newton, and Anil K. Talwar, Long Valley, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 516,002, Jul. 20, 1983, Pat. No. 4,581,232. This application Dec. 19, 1985, Ser. No. 811,130

Int. Cl.[4] A61K *9/18*

U.S. Cl. 424—484 **7 Claims**

1. A medicament adsorbate which comprises magnesium trisilicate having a surface area of at least 400 m^2/g and having a flake-like structure with multiple interstitial spaces, and containing adsorbed therein from about 1% to about 20% by weight of the adsorbate of a medicament drug wherein the medicament drug is selected from the group of antinauseants consisting of dimenhydrinate, meclizine and mixtures thereof.

4,649,042

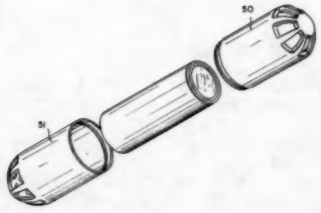
RUMEN DELIVERY DEVICE

Robert C. Davis, Greenfield, Ind.; John W. Gibson, Birmingham, Ala.; Daniel S. Skinner, Jr., Fountaintown, Ind.; Timothy E. Dearth, Indianapolis, Ind., and Dale C. Harris, Fairland, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 615,621, May 31, 1984, abandoned. This application Apr. 3, 1985, Ser. No. 719,195

Int. Cl.[4] A61K *9/22, 9/30, 37/24*

U.S. Cl. 424—438 **177 Claims**



1. A sustained release drug delivery device for use in the rumen of a ruminant animal which comprises a polymeric core wherein the polymer comprises from about 60% to about 95% of lactic acid and from about 40% to about 5% of glycolic acid and has a number average molecular weight of from about 2000 to about 6000, in which polymer a medicament beneficial when administered to the digestive tract of the ruminant animal is dissolved or suspended, which core is contained in a tube made of material with a density from about 6 to about 10 g./cc. which is compatible with the rumen, which tube has at least one end open for its full diameter, wherein a layer at least 0.7 mm. thick of elastic sealant fills the full length of the annulus between the core and the tube and forms an adhesive bond to both the core and the tube, which sealant is substantially impermeable to water, compatible with both the tube and the core, and compatible with and unaffected by the rumen.

4,649,043

DRUG DELIVERY SYSTEM FOR DELIVERING A PLURALITY OF TINY PILLS IN THE GASTROINTESTINAL TRACT

John Urquhart, Palo Alto, and Felix Theeuwes, Los Altos, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation of Ser. No. 360,477, Mar. 22, 1982, Pat. No. 4,434,153. This application Jan. 16, 1984, Ser. No. 571,299
The portion of the term of this patent subsequent to Feb. 28, 2001, has been disclaimed.
Int. Cl.[4] A61K 9/22, 9/26
U.S. Cl. 424—469 5 Claims

1. An orally administrable dispensing device shaped and adapted for oral admittance into the gastrointestinal tract for extended residency in the stomach of the gastrointestinal tract as an in vivo reservoir for the controlled delivery of a beneficial, orally administrable drug to the gastrointestinal tract for executing a therapeutic program in the gastrointestinal tract, the dispensing device comprising:

(1) a matrix comprising a pharmaceutically acceptable nontoxic, non-hydrated polyethylene oxide that exhibits the ability to retain fluid within its polyethylene oxide structure, absorb fluid from the gastrointestinal tract, and expand with at least a 2 fold volume increase for retaining the dispensing device in the stomach over an extended period of time;

(2) a plurality of tiny pills dispensed throughout said matrix comprising the polyethylene oxide, the tiny pills comprising:

(a) a dosage amount of a beneficial orally administrable drug; and

(b) a wall comprising a release rate controlling composition comprising a cellulosic polymer that surrounds the dosage amount of drug; and,

(3) wherein, when the dispensing device is in the gastrointestinal tract fluid environment of use, the device executes the therapeutic program for imparting a beneficial effect by (c) tiny pills delivering drug in the stomach for absorption in the stomach and for passage into the intestine for absorption in the intestine, and by (d) the matrix comprising polyethylene oxide releasing tiny pills for tiny pills passing into the intestine with the tiny pills delivering drug over a prolonged period of time.

4,649,044

ORAL COMPOSITION

Tetsuo Gomi, Tokyo; Nobuo Suganuma, Funabashi; Kazuo Ishii, Kawaguchi, and Hiroshi Sato, Saitama, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Jun. 30, 1983, Ser. No. 509,668
Claims priority, application Japan, Jun. 30, 1982, 57-114505
Int. Cl.[4] A61K 7/16, 7/22, 9/68
U.S. Cl. 424—49 10 Claims

1. An oral paste composition, comprising:

0.01 to 5% by weight of an antiplasmin agent selected from the group consisting of tranexamic acid, ε-aminocaproic acid and their alkyl ester and aryl ester derivatives,

0.01 to 10% by weight of a flavor mixture,

a surface-active agent and water characterized in that said flavor mixture comprises 0.05 to 90% by weight based on the total weight of the flavor mixture of a compatible aldehyde flavor selected from the group consisting of perillaldehyde, myrtenal, benzaldehyde, anisaldehyde, heliotropin, 3-methylbutanal, 2-methylbutanal, hexanal, 10-undecanal, decanal, citronellal, dodecanal, hydroxycitronellal, α-methylcinnamaldehyde and mixtures thereof wherein said oral paste composition is free of Schiff base discoloration caused by an antiplasmin agent amino group reacting with an aldehyde group of said aldehyde flavors.

4,649,045

COATING COMPOSITIONS AND NAIL POLISH COMPOSITIONS INCLUDING THE SAME

Joseph E. Gaske, Mt. Prospect, and Edwin A. Zychowski, Des Plaines, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Apr. 3, 1986, Ser. No. 847,504
Int. Cl.[4] A61K 7/043; C08L 33/14
U.S. Cl. 424—61 26 Claims

1. A solvent solution thermoplastic coating composition comprising an admixture of from about 40 percent to about 60 percent of a first solution copolymer and from about 60 percent to about 40 percent of a second solution copolymer, based on the total weight of the mixture of copolymers, said solution copolymers each comprising from about 40 percent to about 80 percent of an aromatic monoethylenic monomer together with a mixture of about 5 percent to about 40 percent of a monoethylenic ester formed with an alkanol having from about 1 to about 18 carbon atoms, from about 0.5 percent to about 15 percent of a hydroxy alkyl ester of a monoethylenic carboxylic acid and from about 0.5 percent to about 8 percent of a monoethylenic carboxylic acid, said proportions being based by weight on the total weight of monomers copolymerized to form each of the respective copolymers, to provide the first solution copolymer with a glass transition temperature in the range of about 40 degrees Centigrade to about 70 degrees Centigrade and the second solution copolymer with a glass transition temperature in the range of about −10 degrees Centigrade to about +10 degrees Centigrade.

23. A nail polish composition including the coating composition of claim 1.

4,649,046

AIR FRESHENER

Robert D. Kross, Bellmore, N.Y., assignor to Hydro Optics, Inc., Hackensack, N.J.

Continuation of Ser. No. 361,048, Mar. 23, 1982, abandoned, which is a continuation of Ser. No. 934,224, Apr. 15, 1978, abandoned, which is a continuation of Ser. No. 740,151, Nov. 8, 1976, abandoned, which is a continuation-in-part of Ser. No. 567,894, Apr. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 432,068, Jan. 9, 1974, Pat. No. 3,877,431. This application Jun. 28, 1984, Ser. No. 625,189
Int. Cl.[4] A61K 31/74, 31/78; A61L 9/01
U.S. Cl. 424—76 3 Claims

1. A solid shape-retaining room air dispensing product for gradually dispensing a volatilizable fragrance into a room atmosphere comprising:

a cross-linked polymer of a hydroxypropyl methacrylate or hydroxyethyl methacrylate monomer and a cross-linking agent of pentaerythritol triacrylate, the cross-linking agent being present at from about 1 to about 10 weight percent relative to the weight of the monomer;

in combination with from about 5 to about 20 weight percent, relative to the total weight of the product, of a volatilizable, lipophilic active fragrance which has not been prematurely volatilized or degraded during polymerization of the monomer and cross-linking agent, and from about 10 to 25 weight percent, relative to the total weight of the product, of a nonionic surfactant of nonylphenoxypolyethoxyethanol, the nonionic surfactant having an HLB ratio between about 8.8 and 14 and having hydrophilic and lipophilic functions selected to dissolve or disperse the active fragrance in the polymer;

the weight percentage of monomer present in the product being essentially 100 percent less the weight percentages of cross-linking agent, active fragrance and nonionic surfactant;

the cross-linked polymer being a matrix in which the active fragrance is dispersed by the nonionic surfactant;

the product being substantially free from other ingredients, being substantially clear, being substantially shape retain-

ing, being substantially inflexible, and allowing sustained release of the active fragrance into the atmosphere.

4,649,047

OPHTHALMIC TREATMENT BY TOPICAL ADMINISTRATION OF CYCLOSPORIN

Renee Kaswan, Athens, Ga., assignor to University of Georgia Research Foundation, Inc., Athens, Ga.

Filed Mar. 19, 1985, Ser. No. 713,701
Int. Cl.[4] A61K *37/00, 31/74*
U.S. Cl. 424—78 20 Claims

1. A method for the treatment of phacoanaphylactic endophthalmitis in the anterior or posterior segment of an eye which comprises administering a therapeutically effective amount of a cyclosporin topically to said eye.

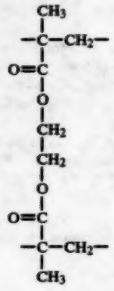
4,649,048

NOVEL BILE SEQUESTRANT RESIN

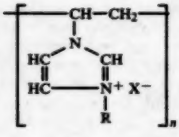
Porter C. Johnson, Pasadena, Calif., assignor to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 609,408, May 11, 1984, Pat. No. 4,604,430.
This application Dec. 23, 1985, Ser. No. 812,606
Int. Cl.[4] A61K *7/04*
U.S. Cl. 424—81 3 Claims

1. A method for sequestering bile acids in a mammal, said method comprising orally administering to said mammal an amount effective to increase the amount of bile acids excreted in the feces of said mammal of a quaternized vinylimidazole-ethylene glycol dimethacrylate copolymer consisting of from about 1% to about 25%, based on the molecular weight of the copolymer, of ethylene glycol dimethacrylate moieties having the structural formula



and the balance to 100% based on the molecular weight of the copolymer of polyvinylimidazolium moieties having the structural formula



wherein n, on average, ranges from 3 to about 40 and wherein R is selected from the group consisting of alkyl and alkenyl groups having from 1 to 18 carbon atoms and $-CH_2R^1$ wherein R^1 is selected from the group consisting of phenyl, $-CH_2OH$, $-CH_2NHCOC_6H_5$, and $-CH_2NR^2R^3$ wherein R^2 and R^3 are each selected from the group consisting of methyl and ethyl and wherein X^- is a pharmaceutically acceptable anion selected from the group consisting of halides, acetate, propionate and phosphate.

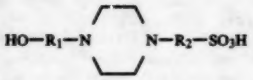
4,649,049

RABIES VACCINE

Jan S. Wilson, Fort Dodge, Iowa, assignor to American Home Products Corporation, New York, N.Y.

Filed Jul. 10, 1984, Ser. No. 629,307
Int. Cl.[4] A61K *39/205*
U.S. Cl. 424—89 15 Claims

1. A rabies vaccine composition comprising a sterilized suspension of at least about 0.3% by weight of proteinaceous suckling mice or rat brain particles of injectable particle size laden with inactivated rabies virus, in an aqueous buffer solution having a slightly basic pH value and an amount, dissolved therein, of a buffer composition sufficient to stabilize the pH at said value, said buffer composition comprising a mixture of an organic base of between 0.02 and 0.08 moles per liter, of a buffer composition comprising an organic base formula



wherein R_1 and R_2 are CH_2, C_2H_4 or C_3H_6, combined with an acid addition salt thereof, which is compatible with virus replication.

4,649,050

ELECTROLYTE SOLUTIONS CONTAINING POLYANIONIC MATERIALS

Richard L. Veech, 712 Brent Rd., Rockville, Md. 20850

Continuation of Ser. No. 623,101, Jun. 22, 1984, abandoned.
This application Jun. 24, 1985, Ser. No. 747,858
Int. Cl.[4] A61K *33/14*
U.S. Cl. 424—153 12 Claims

1. An aqueous electrolyte solution comprising water having dissolved therein:

(a) at least one inorganic cation or at least one inorganic anion,

(b) at least one non diffusible synthetic organic polyionic material selected from the group consisting of polyanionic materials, polycationic materials, and mixed polyanionic/-polycationic materials provided that:

(1) the concentration of any one of (a), and (b) always ranges from about 0.1 to 5,000 millimoles per liter,

(2) the total positive charges equal the total negative charges,

(3) the charge associated with a molecule of said polyionic material ranges from greater than 0 to infinity and

(4) wherein the molarity thereof multiplied by the charge associated with a molecule thereof produces a total anionic equivalent equal to the apparent anion gap of such solution and makes up the apparent deficiency caused by said apparent anion gap.

4,649,051

BEVERAGE PRODUCT

Hans E. Gyllang, Skogsvägen; Bjorn T. Ekblom, Backshägan; Vera V. Wesshagen, Högbyvägen, and Kjell Y. Ericson, Bragevägen, all of Sweden, assignors to AB Pripps Bryggerier, Bromma, Sweden

Filed Jan. 16, 1985, Ser. No. 692,054
Claims priority, application European Pat. Off., Nov. 23, 1984, 84850363
Int. Cl.[4] A61K *33/06, 33/10, 33/08, 31/70*
U.S. Cl. 424—154 11 Claims

1. Beverage product, especially adapted for rapid oral administration of water and carbohydrates to the human body during periods of heavy muscle work, characterized in that it consists of a solution, which contains 3–25% by weight of a mixture of soluble oligosaccharides with DP values between 2 and 10 inclusive, at least one physiologically acceptable alkal-

izing compound in an amount of 0.5–20 grams/liter of beverage the solution's content of the physiologically acceptable alkalizing compound being such that when the beverage is consumed during heavy muscle work that is at about 60% of the maximal aerobic capacity in an amount of 250 mls each fifteen minutes during one hour gives an increase of the pH value in the stomach ventricle contents to 3.5 to about 8.5.

4,649,052

METHOD FOR PRODUCTION OF GARLIC PASTE

Naoki Sumi; Hiroshi Yamashita, both of Kanagawa, and Yasuo Sekizuka, Tokyo, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Jun. 10, 1985, Ser. No. 743,208

Claims priority, application Japan, Jun. 11, 1984, 59-118173

Int. Cl.⁴ A23L *1/214, 1/221*

U.S. Cl. 426—49 **4 Claims**

1. A method for the production of garlic paste, comprising the steps of:

(i) subjecting garlic bulbs as wrapped in the skin to a heating treatment in the range of from 99° to 120° C., adding water to said garlic bulbs in an amount by weight of from 0.3 to 2 times based on the amount of said garlic bulbs, coarsely crushing said garlic bulbs, and separating said skin and other unwanted parts of the garlic bulbs from the resultant crushed mass of garlic, leaving behind a garlic clove-containing liquid,

(ii) heating said garlic clove-containing liquid to a temperature in the range of from 60° to 70° C. together with vitamin B_1 in an amount of about 0.001 to 0.005 wt% (calculated based on hydrochloride salt of vitamin B_1) based on the amount of garlic bulbs wrapped in the skin, rice bran in an amount of from about 0.5 to 2.5% based on the amount of garlic bulbs wrapped in the skin, or yeast in an amount of from 1 to 3% by weight based on the amount of garlic bulbs wrapped in the skin added thereto,

(iii) optionally adding a cellulase to the product of step (ii) and heating the resultant blend at a temperature in the range of from 40° to 60° C. and at a pH of from 4 to 6, and

(iv) heating either the liquid part of the product of step (iii) resulting from the removal of solids therefrom together with soybean flour, soybean milk, or soybean milk flour in an amount of from about 1 to about 10% by weight based on the dry weight of the clove-containing liquid or said product of step (ii) in the unmodified form thereof together with soybean flour, soybean milk, or soybean milk flour in an amount of from about 1 to about 20% by weight based on the dry weight of the clove-containing liquid.

4,649,053

METHOD FOR MAKING PIZZA

Mark Lamonica, 1533 85th St., Brooklyn, N.Y. 11228

Continuation of Ser. No. 748,145, Jun. 21, 1985, abandoned, which is a continuation of Ser. No. 671,026, Nov. 14, 1984, abandoned, which is a continuation of Ser. No. 398,197, Jul. 14, 1982, abandoned. This application Mar. 17, 1986, Ser. No. 841,046

Int. Cl.⁴ A21D *8/00*

U.S. Cl. 426—302 **7 Claims**

1. A method for making pizza, comprising the steps of:

(a) placing a layer of uncooked pizza dough on a thermally conductive, imperforate, flat surfaced, rigid metal disk, said imperforate disk having an upturned peripheral lip on which a peripheral portion of said layer of uncooked pizza dough is placed, thereby raising up said peripheral portion of said layer of pizza dough;

(b) placing said imperforate disk in a pan having an annular side wall and a bottom portion with at least one opening therein, so that said imperforate disk covers said at least one opening,

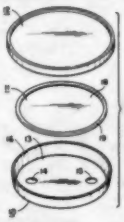
(c) placing a cover on said pan over said imperforate disk and uncooked pizza dough, so that said uncooked dough is enclosed in a substantially sealed container formed by said imperforate disk, annular side wall and cover;

(d) allowing said substantially sealed container, with said uncooked dough therein, to stand for a period of time of at least one hour and sufficient to permit rising of the dough in said container;

(e) removing said cover from said pan;

(f) removing said disk with said uncooked pizza dough thereon from said pan by pushing against the bottom of said imperforate disk through said at least one opening of said pan so that said imperforate disk is free of said annular side wall;

(g) placing desired pizza food ingredients on said uncooked risen pizza dough;



(h) placing said imperforate disk and the uncooked pizza dough thereon in a cooking oven, and allowing said pizza dough and pizza food ingredients to cook in said oven on said imperforate disk to form a cooked pizza, said imperforate disk and pizza dough with said ingredients thereon presenting a substantially flat arrangement in said oven with no upstanding side wall therearound, so that heated air in said oven freely circulates over the pizza being cooked without being blocked by upwardly directed side walls, thereby improving cooking of the pizza; and

(i) removing said imperforate disk and cooked pizza as a unit from said oven.

4,649,054

BEER CONTAINER HAVING MEANS FOR FROTHING THE CONTENT THEREOF

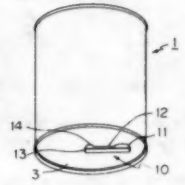
Hideo Tanaka, Takarazuka; Kuniyoshi Ohhashi, Ikeda; Tatsuya Gomi, Sakai, and Tomoyuki Dobashi, Fujisawa, all of Japan, assignors to Suntory Limited, Osaka and Dainippon Ink and Chemicals, Inc., Tokyo, both of, Japan

Filed Jul. 26, 1985, Ser. No. 759,325

Claims priority, application Japan, Aug. 1, 1984, 59-162171; Aug. 7, 1984, 59-121248[U]; Aug. 7, 1984, 59-121250[U]; Jan. 22, 1985, 60-8315; Jan. 23, 1985, 60-6694[U]; Jan. 24, 1985, 60-7306[U]; Jan. 24, 1985, 60-8639[U]

Int. Cl.⁴ B65B *55/00;* **B65D** *90/00*

U.S. Cl. 426—397 **20 Claims**



1. A beer container comprising a sealed container body and means for vibrating at least part of a wall of said container body, said vibrating means comprising a mounting member attached to the wall of said contaiher body and a movable member, one part of which constituting a free end and the other part being resiliently connected to said mounting member so that a vibration is imparted to the wall by striking it with the free end of said movable member which has preliminary

been resiliently displaced against the wall, whereby a micro-froth layer may be produced on a surface of beer contained in said container body arter opening of said container body.

19. A method for forming a micro-froth layer on a surface of beer in an openable container containing said beer comprising the steps of: opening said container and vibrating at least a part of wall of said container by striking said part of the wall with a movable member resiliently mounted to said container.

4,649,055

PROCESS FOR PRODUCING IMPROVED DEHYDRATED RICE AND PRODUCT

David E. Kohlwey, Houston, Tex., assignor to Louisiana State Rice Milling Company Inc., Houston, Tex.

Filed Jan. 13, 1984, Ser. No. 570,629
Int. Cl.[4] A23L *1/182*
U.S. Cl. 426—449 **15 Claims**

1. A process for producing cooked and dehydrated rice which rapidly rehydrates in about one minute to a palatable consistency by mixing with hot water, comprising:

hydrating a non-waxy variety of dry rice with water at a temperture of up to 65° C. for a period of time sufficient to raise the moisture content of said rice from an initial 8–15% to up to 70%;

gelatinizing said hydrated rice at a temperature above 65° C.;

glassifying said gelatinized rice in a water limiting environment which maintains the moisture content of said rice below about 75%; and

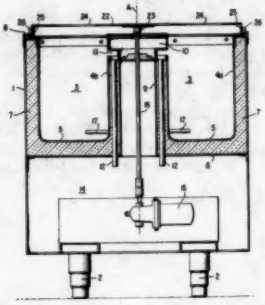
thereafter drying said glassified rice.

4,649,056

METHOD OF COOKING FOOD IN A ROTARY COOKING APPARATUS

Mario Cardullo, Alexandria; Mark Caraluzzi, Vienna, and Peter Schildbach, Alexandria, all of Va., assignors to Yankee Noodle Dandy, Inc., Alexandria, Va.

Division of Ser. No. 722,365, Apr. 12, 1985, Pat. No. 4,597,325.
This application Apr. 18, 1986, Ser. No. 866,621
Int. Cl.[4] A23L *1/01*
U.S. Cl. 426—509 **1 Claim**



1. A method of cooking foodstuff comprising the following steps:

(a) maintaining a circular water bath in a boiling state:

(b) charging a perforated basket with the foodstuff to be cooked;

(c) submerging the basket into the boiling water bath;

(d) continuously moving the basket in a substantially horizontal, circular path in the boiling water bath;

(e) introducing water into said water bath and drawing water from the top of the water bath at least intermittently for effecting an upward water circulation and for drawing off scum or starch from the surface of water bath and

(f) removing the basket from the water bath upon completion of cooking performed in step (d).

4,649,057

PRESERVATIVE COATING AND METHOD FOR PRESERVING FRESH FOODS

Tom R. Thomson, 65 Ramon, Sonoma, Calif. 95476

Filed Dec. 30, 1985, Ser. No. 814,762
Int. Cl.[4] A23D *5/00, 5/02;* **A23B** *7/00*
U.S. Cl. 426—532 **6 Claims**

6. A method of preparing a preservative coating for food comprising the steps of:

mixing and melting 3 grams of hydrogenated soybean oil with 1.5 grams of stearic acid to form a first mixture,

adding approximately 0.15 grams of methylparaben to said first mixture to form a second mixture,

adding and mixing 0.3 grams of an anionic emulsifier to said second mixture to form a third mixture,

preheating approximately 150 grams of water to approximately 80° Centrigrade, and

blending said third mixture into said preheated water to form an oil-in-water emulsion.

4,649,058

GLUCO-OLIGOSACCHARIDE MIXTURE AND A PROCESS FOR ITS MANUFACTURE

Dieter Schwengers, Dormagen, Fed. Rep. of Germany, assignor to Pfeifer & Langen, Cologne, Fed. Rep. of Germany

Filed Jun. 5, 1985, Ser. No. 741,394
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1984, 3422247
Int. Cl.[4] C12D *13/02;* **A23L** *1/236*
U.S. Cl. 426—658 **18 Claims**

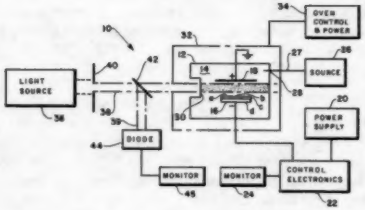
1. A process for the manufacture of a gluco-oligosaccharide mixture having up to 30 anhydroglucose units, which comprises forming (a) an aqueous solution containing α(1→6)-D-glucosyl transferase and a mono- or di-saccharide composed of glucose units, the solution containing at least 200 mmol of the saccharide per 1000 U of transferase, and at a temperature of 265 to 310 K and a pH from 4.5 to 8 mixing solution (a) with (b) an aqueous sucrose solution in an amount such that the molar ratio of sucrose to glucose units is from 2.0 to 5.0.

4,649,059

PHOTOIONIZATION TECHNIQUE FOR GROWTH OF METALLIC FILMS

James G. Eden, Champaign, and David B. Geohegan, Urbana, both of Ill., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 29, 1985, Ser. No. 738,817
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—38 **15 Claims**



1. A method for producing a thin film of a material, comprising the steps of:

a. providing a halogen compound of said material;

b. heating said halogen compound within a substantially closed chamber to produce a vapor of said halogen compound;

c. irradiating said halogen compound vapor with light of preselected wavelength to dissociatively photoionize said

vapor into the constituent positive ions of said material and negative halogen ions; and

d. generating an electric field within said irradiated vapor to selectively remove said positive ions of said material from said vapor for plating as said film of said material.

7. A system for producing a thin film of a material, comprising:

a. a substantially closed chamber;

b. a supply of a halogen compound of said material within said chamber;

c. means for heating said halogen compound to produce a vapor of said halogen compound within said chamber;

d. a source of light of preselected wavelength for irradiating said vapor to dissociatively photoionize said vapor into the constituent positive ions of said material and negative halogen ions; and

e. means for generating an electric field within said vapor irradiated by light from said source to selectively remove said positive ions of said material from said vapor for plating as said film of said material.

4,649,060

METHOD OF PRODUCING A PREFORM WIRE, SHEET OR TAPE FIBER REINFORCED METAL COMPOSITE

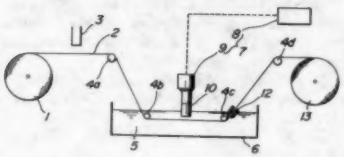
Toshikatsu Ishikawa, Tokyo; Haruo Teranishi, Machida; Yoshikazu Imai, Tokyo, and Yoichi Nagata, Yokohama, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 15, 1985, Ser. No. 712,118

Claims priority, application Japan, Mar. 22, 1984, 59-53542

Int. Cl.⁴ B05D 3/12

U.S. Cl. 427—57 **5 Claims**



1. A method of producing a preform wire, sheet or tape fiber reinforced metal composite, comprising unfastening and drawing a silicon carbide fiber bundle such that the element fibers constituting the fiber bundle are uniformly arranged in a parallel relation along their length direction, and impregnating the fiber bundle for a period of time of not longer than 50 seconds with a molten metal, while ultrasonically vibrating the fiber bundle.

4,649,061

METHOD OF APPARATUS FOR DEPOSITING OXIDE-CATHODE PRECURSOR MATERIAL ON A CATHODE SUBSTRATE BY AIR SPRAYING

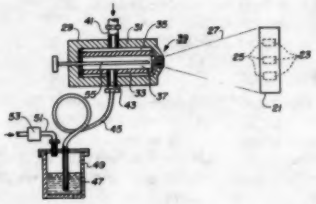
Hemmige V. Rangachar, Newtown, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed May 22, 1985, Ser. No. 736,825

Int. Cl.⁴ B05D 1/02

U.S. Cl. 427—78 **5 Claims**

1. A method for depositing a layer of oxide-cathode precursor material on a cathode substrate comprising passing a slurry of said precursor material from a pool of said slurry in a closed vessel through a tubular means to an air-spray gun, said tubular means presenting a predetermined resistance to the flow therethrough of said slurry, producing a controlled pressure in said closed vessel that is substantially above atmospheric pressure, said vessel pressure controlling the rate of flow of said slurry to said gun, flowing compressed gas through said gun in such manner as to produce a siphon pressure in said tubular means and to produce a spray of said slurry, and scanning said spray across the surface of said substrate, wherein said siphon pressure includes a constant pressure component and a fluctuating pressure component, and said predetermined resistance is sufficient to reduce the effects of said fluctuating pressure component on the slurry in said tubular means.



4,649,062

ULTRAVIOLET RADIATION CURABLE VEHICLE FOR CERAMIC COLORS, COMPOSITION AND METHOD

Raymond S. Koslorek, Houston, Pa., and Leslie R. Gatechair, Mt. Kisco, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 455,685, Jan. 5, 1983, abandoned. This application Apr. 25, 1985, Ser. No. 727,184

Int. Cl.⁴ C08F 2/50; B32B 27/16

U.S. Cl. 427—54.1 **13 Claims**

1. An ultraviolet radiation curable vehicle for ceramic frits, said vehicle comprising

(a) not less than three polymerizable liquid oligomers, each containing acrylate or methacrylate functional end groups and selected from

(i) a difunctional- or trifunctional-polyester acrylate or methacrylate, a difunctional- or trifunctional-polyether acrylate or methacrylate, a difunctional- or trifunctional-polyester-polyether acrylate or methacrylate, a difunctional- or trifunctional-polyurethane acrylate or methacrylate or a mixture of any of the foregoing;

(ii) an at least tetrafunctional polyester-polyether acrylate or methacrylate; and

(iii) an epoxidized unsaturated fatty acid triglyceride acrylate or methacrylate; the amount of (ii) being at least sufficient to increase solvent resistance of the cured vehicle and the amount of (iii) being at least sufficient to enhance the adhesion thereof to a substrate;

(b) not less than three polymerizable liquid monomers, each containing acrylic or methacrylic functional groups and selected from

(i) a monofunctional polyether acrylate or methacrylate;

(ii) at least one difunctional polyglycol acrylate or methacrylate; and

(iii) at least one trifunctional aliphatic triacrylate or trimethacrylate; the ratios of (i), (ii) and (iii) being selected to provide an acrylate or methacrylate functionality of not less than 1 nor more than 3;

(c) an effective amount of a photoinitiator combination comprising

(i) a 2-phenyl acetophenone compound;

(ii) a substituted thioxanthone compound; and

(iii) an ester of an aminobenzoic acid, or a tertiary amine, the ratios of (i), (ii) and (iii) being selected to provide a balance of surface cure and through cure on ultraviolet exposure of films comprising said vehicle; and

(d) an amount of a polymerization inhibitor which is at least effective to retard polymerization of the vehicle in total darkness, but less than an amount which will significantly retard the rate of cure of said vehicle when exposed to ultraviolet light.

4,649,063

METHOD FOR WATERPROOFING SILICA-CERAMIC INSULATION BODIES

Levy A. Canova, Orange Park; Ralph J. DePasquale, and Michael E. Wilson, both of Jacksonville, all of Fla., assignors to SCM Corporation, New York, N.Y.

Filed May 8, 1985, Ser. No. 731,978
Int. Cl.[4] B05D 7/22, 3/02
U.S. Cl. 427—230 13 Claims

1. A method for improving the resistance to absorption of water by a porous, rigid, sintered and pressed block of short staple amorphous silica fiber, which comprises distributing within the pores of said block an alkyl or fluoroalkyl alkoxy silane substantially free of deleterious residual, and halide originally bound to silicon and having the general formula:

$$(RO)_{4-n}—Si—[(R')—(QR'')_y]_n$$

wherein R is an alkyl group or fluorine substituted alkyl group containing from 1 to 3 carbon atoms, R' is hydrogen, or aryl, or alkyl, or alkylene, or fluorine substituted alkyl or alkylene group containing from 2 to 10 carbon atoms, R'' is an alkyl group or fluorine substituted alkyl group containing from 2 to 4 carbon atoms, Q is oxygen, nitrogen, or sulfur, n is 1 to 3, y is 0 or 1, and when y is 1, R' is alkylene or fluorine substituted alkylene containing from 2 to 10 carbon atoms.

4,649,064

RAPID-DRYING RECORDING ELEMENT FOR LIQUID INK MARKING

Raymond T. Jones, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 10, 1986, Ser. No. 837,993
Int. Cl.[4] B41M 5/00
U.S. Cl. 427—256 37 Claims

16. In an inking process in which a water-based liquid ink is applied to the surface of an image-recording element in order to form ink markings thereon, the improvement wherein:

(1) said water-based ink comprises a water-dispersible cross-linkable colorant/resin composition: and

(2) said image-recording element comprises a support having thereon an ink-receiving layer of a hydrophilic cross-linkable film-forming material which is cross-linked to a degree sufficient to render it waterfast while permitting it to rapidly absorb said water-based ink, said ink-receiving layer comprising a cross-linking agent that cross-links said colorant/resin composition to thereby render said ink markings waterfast.

4,649,065

PROCESS FOR PRESERVING WOOD

Richard W. Hein, Hudson, Ohio, and William C. Kelso, Coldwater, Miss., assignors to Mooney Chemicals, Inc., Cleveland, Ohio

Filed Jul. 8, 1985, Ser. No. 752,881
Int. Cl.[4] A01N 55/02; B05D 1/18, 3/12
U.S. Cl. 427—370 23 Claims

1. An improved process for preserving wood by impregnating wood with metal salts which comprises the steps of

(A) contacting wood in a vessel with a solution containing at least one soluble metal salt of an organic carboxylic acid under conditions of time, temperature and pressure which are sufficient

(i) to effect penetration of the solution into the wood, and

(ii) to maintain the metal:acid ratio in the solution removed from the wood in step (B) substantially the same as the metal:acid ratio in the solution used to impregnate the wood in this step (A),

(B) removing at least some of the solution from the wood by reducing the pressure within the vessel and mixing said removed solution with the solution in the vessel, and

(C) subsequently heating the wood to a temperature sufficient to fix the metal to the wood.

4,649,066

ANTICORROSION COATINGS FOR POROUS CONCRETE METAL REINFORCING STRUCTURES

Dieter Gerhardinger; Karl-Heinrich Wegehaupt, both of Burghausen, and Hans-Rudolf Pfeffer, Emmerting, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 14, 1985, Ser. No. 798,048
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1985, 3503276
Int. Cl.[4] B05D 3/02
U.S. Cl. 427—387 6 Claims

1. An anticorrosive coating for metal reinforcing structures which comprises metal reinforcing structures having an organopolysiloxane elastomeric coating thereon, said organopolysiloxane elastomeric coating is a crosslinked diorganopolysiloxane copolymeric composition which is obtained from the free radical copolymerization of styrene and a(meth-)acrylic acid ester in the presence of the diorganopolysiloxane.

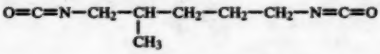
4,649,067

ONE-COMPONENT BAKING ENAMELS

Rainer Gras, Bochum, Fed. Rep. of Germany, assignor to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

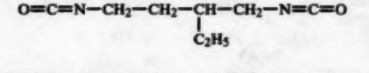
Filed May 24, 1984, Ser. No. 613,797
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1983, 3322722
Int. Cl.[4] B05D 3/02; C08G 18/81; C08K 5/10
U.S. Cl. 427—388.2 16 Claims

1. One-component baking enamels comprising polyesters, containing hydroxyl groups, and polyisocyanates, wherein the polyisocyanate component consists of 2-methyl-1,5-diisocyanatopentane (MPDI) having the formula (I):



(I)

which is blocked totally or partially by ε-caprolactam or acetoxime, or a mixture of the same with 2-ethyl-1,4-diisocyanatobutane (EBDI) having the formula (II):



(II)

which is blocked totally or partially by ε-caprolactam or acetoxime, wherein the diisocyanate mixture of (I) and (II) has about 88 to 99% by weight of (I) and about 12 to 1% by weight of (II) and the free isocyanate (NCO) content is up to about 10% by weight; and a solvent having a lower limit of the boiling point of around 100° C.

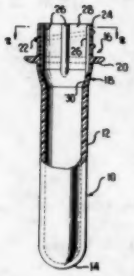
15. A method of imparting weather resistance to a metal, glass or plastic object which comprises applying the one-component baking enamel of claim 1 to the surface of said object, and heating said coated object to a temperature in the range of 120° to 350° C. for a period of 30 minutes to 30 seconds, thereby hardening said enamel.

4,649,068

PREFORM FOR USE IN BLOW MOLDING A CONTAINER SUBJECTED TO HOT FILLING AND CLOSED BY A ROTATABLE CLOSURE, AND METHOD OF AN APPARATUS FOR MAKING THE SAME

Wayne N. Collette, Merrimack, N.H., assignor to Continental Pet Technologies, Inc., Stamford, Conn.

Filed Apr. 22, 1985, Ser. No. 725,540
Int. Cl.[4] B65D 1/00
U.S. Cl. 428—35 11 Claims



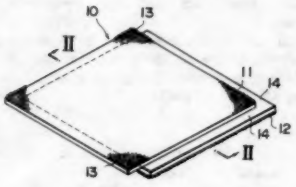
1. A preform for use in blow molding a polyester container subjected to hot filling and closed by a rotatable closure, said preform having an as formed container neck finish and a tubular body to be subjected to both axial and hoop direction stretching, said neck finish including external thread means for receiving a closure, said preform being improved by said neck finish defining a container mouth having an internal diameter greater than said tubular body internal diameter, said mouth being joined to said tubular body interior by an inverted generally conical surface, and said neck finish being reinforced by internal axially extending structural shape maintaining ribs projecting radially inwardly from said mouth, said ribs forming means for preventing axial collapse of said neck finish.

4,649,069

RECTANGULAR TILE-LIKE CARPET

Yasuyoshi Tone, Yokohama, Japan, assignor to Sazmi Co., Ltd., Tokyo, Japan

Filed May 8, 1985, Ser. No. 732,034
Claims priority, application Japan, May 12, 1984, 59-69502[U]; May 12, 1984, 59-69503[U]
Int. Cl.[4] B32B 3/02
U.S. Cl. 428—82 2 Claims



1. A carpet comprising a rectangular tile-like carpet body, said carpet body consisting of front and back pile layers, wherein two sides of said carpet body form a first corner thereof, each side having at least one extension extending in the plane of and substantially flush with one surface of said body and having a thickness substantially one half the thickness of said body, while the other two sides of said body form a second corner diagonally opposite said first-mentioned corner, each side forming said second corner having at least one depression complementary to and having the same size as said extension.

4,649,070

SUBSTRATE FOR AN INTEGRATED CIRCUIT

Kazuo Kondo, and Tsuneyuki Sukegawa, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Dec. 13, 1985, Ser. No. 808,565
Claims priority, application Japan, Dec. 14, 1984, 59-265145
Int. Cl.[4] B32B 3/00, 15/04
U.S. Cl. 428—209 6 Claims

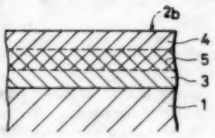
1. A substrate for supporting an integrated circuit device, said substrate being comprised of a ceramic member with a thin film of conductive metal applied to selective portions thereof, said ceramic member consisting essentially of a sintered ceramic material capable of forming a surface finish upon sintering of a roughness, a factor of about ten times less than the thickness of said thin film, said ceramic material being selected from the group consisting of crystalline glasses and glass-coated ceramic compositions.

4,649,071

COMPOSITE MATERIAL AND PROCESS FOR PRODUCING THE SAME

Ichiro Tajima, Nagoya, and Minoru Yamamoto, Aichi, both of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Apr. 29, 1985, Ser. No. 728,698
Claims priority, application Japan, Apr. 28, 1984, 59-87116; May 14, 1984, 59-96143
Int. Cl.[4] B32B 7/02; B05D 3/06
U.S. Cl. 428—212 27 Claims



1. A composite material comprising a substrate and at least a single surface layer formed thereon, said surface layer comprising an adhesive component and a protective component, said surface layer having a structure wherein a first side in contact with said substrate contains a larger amount of said adhesive component than a second side of said surface layer, and said second side of said surface layer contains a larger amount of said protective component than said first side of said surface layer, said adhesive component being a polymer formed by plasma polymerization and having an adhesive property, and said protective component being a polymer formed by plasma polymerization and having a hydrophobic or hydrophilic property.

4,649,072

MAGNETIC RECORDING MEDIUM

Katsumi Ryoke; Nobutaka Yamaguchi; Masatoshi Takahashi; Kazuko Hansi; Hideaki Kosha, and Eiichi Tadokoro, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 23, 1985, Ser. No. 779,348
Claims priority, application Japan, Sep. 21, 1984, 59-196567; Oct. 12, 1984, 59-212602
Int. Cl.[4] G11B 5/68, 5/78
U.S. Cl. 428—212 22 Claims

1. A magnetic recording medium comprising a non-magnetic support having provided thereon a magnetic layer on one side and a backing layer on the other side, wherein the backing layer contains (1) non-magnetic powders containing carbon

black having an average particle diameter of from 0.15 to 1.0 μm; (2) two or more binders wherein (a) at least one of the binders is a resin having a 100% modulus of from 15 to 150 kg/cm^2 in an amount of from 50 to 95 wt% based on the total amount of the binders in the backing layer, and (b) the remaining binder is, or if more than one remaining binder is present, the remaining binders are a resin other than the resin having a 100% modulus of from 15 to 150 kg/cm^2, and the weight ratio of all the non-magnetic powders to all the binders in the backing layer is from 300:100 to 40:100; and (3) a polyisocyanate in an amount of from 15 to 40 wt% based on the total amount of the binders in the backing layer.

4,649,073

MAGNETIC RECORDING MEDIUM

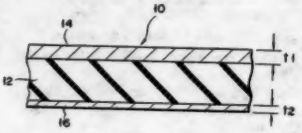
Toshiyuki Suzuki, and Reiji Nishikawa, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 6, 1985, Ser. No. 708,939

Claims priority, application Japan, Mar. 9, 1984, 59-45206

Int. Cl.^{4} G11B *5/62*

U.S. Cl. 428—212 **4 Claims**



1. A disk-shaped magnetic recording medium which can record data on two surfaces thereof in accordance with a perpendicular magnetic recording technique, comprising:

a flexible base layer; and

magnetic recording layers which sandwich said base layer therebetween and are formed to have different film thicknesses whose ratio is set so as to prevent a curl phenomenon from occurring in said magnetic recording medium, wherein a first recording layer is, thicker than a second recording layer, and has a perpendicular coercive force which is higher than that of said second recording layer so as to compensate for a decrease in a perpendicular recording density of said first recording layer due to the enlargement in thickness thereof, whereby the amount of a curl occurring in said recording medium may be minimized, and any non-coincidence between perpendicular recording densities of said first and second recording layers may be simultaneously compensated for.

4,649,074

PAPERMACHINE FABRIC IN THE FORM OF A SPIRAL LINK BELT COVERED WITH NONWOVEN FABRIC

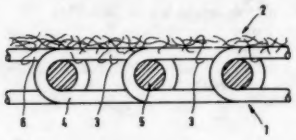
Georg Borel, Reutlingen, Fed. Rep. of Germany, assignor to Hermann Wangner GmbH & Co., KG, Fed. Rep. of Germany

Filed Jul. 31, 1986, Ser. No. 891,032

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1985, 3528363

Int. Cl.^{4} D03D *13/00*

U.S. Cl. 428—222 **6 Claims**



1. A paper machine fabric comprising a spiral link belt having a plurality of interengaged spiral elements defining upper and lower surfaces and a non-woven fabric superimposed on and bonded to said upper surface of said spiral link belt wherein said non-woven fabric is comprised of a plurality of finite length fibers having ends thereof entangled with and wrapped about said spiral elements.

4,649,075

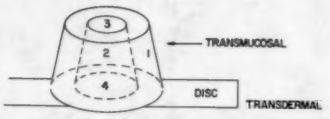
TRANSDERMAL AND TRANSMUCOSAL VORTEXED FOAM DEVICES AND THE METHOD OF MAKING

Leonora Jost, R.R. 1, Box 130, Oxford, Me. 04270

Filed Aug. 9, 1984, Ser. No. 639,097

Int. Cl.^{4} A61M *31/00*; A61F *13/20*; A61L *15/00*

U.S. Cl. 428—305.5 **23 Claims**



1. A device for delivery of medicaments to epidermal and mucosal surfaces comprising:

(a) a microporous outer portion made from polymeric foam, and

(b) A macroporous inner portion made from polymeric foam disposed within the outer portion and in substantial communication therewith which is adapted for the incorporation therein of a medicament,

wherein the macroporous inner portion has at least one free surface not in communication with the microporous outer portion, the pore size ratio of the macroporous inner portion to the microporous outer portion is between about 2 to 1 and 1.67 to 1.

4,649,076

SLIP COATING CHAFF

Brian C. F. Butters, Portsmouth, and Ian D. Pollicott, Hayling Island, both of England, assignors to Chemring PLC, Portsmouth, England

Filed Jul. 26, 1985, Ser. No. 759,259

Claims priority, application United Kingdom, Aug. 9, 1984, 8420313

Int. Cl.^{4} D02G *3/00*; B05D *3/02*; B32B *9/00*

U.S. Cl. 428—361 **10 Claims**

1. Aluminised glass fibre chaff having a slip coating comprising a chemically bonded surface-layer of aluminium palmitate.

4,649,077

HEAT ACTIVATABLE MULTI-COMPONENT SHEET MATERIAL & PROCESS FOR MAKING SAME

Alfred E. Lauchenauer, Horn, Switzerland, assignor to Adnovum AG, Switzerland

Continuation of Ser. No. 482,209, Apr. 5, 1983, abandoned. This application May 20, 1985, Ser. No. 736,416

Claims priority, application United Kingdom, Apr. 7, 1982, 8210284; May 18, 1982, 8214438

Int. Cl.^{4} B32B *5/16, 5/18, 7/12*; C09J *7/02*

U.S. Cl. 428—317.1 **20 Claims**

1. A method of producing a sheet of multi-component heat activatable adhesive consisting essentially of

(i) blending the components of the bonding layer in the form of free flowing particles; said components comprising at least two thermo-plastics each in the form of discrete particles capable of abuttal with adjacent particles to form an adhesive matrix having an open porous structure, one of said components having a tackifying temperature which is lower than the other blend components;

(ii) applying the blend of particles to a supporting sheet material having an adhesion to any of the particles which is lower than the cohesion between the particles;

(iii) heating the particles and said support sheet to a temperature at which said component with the lower tackifying temperature becomes tacky but insufficient to cause the blend to form a non-open, non-porous structure and causing or allowing said components to form an open porous structure;

(iv) and thereafter cooling to below said lower tackifying temperature; thereby to provide on removal of the support sheet a sheet of still substantially discrete component materials.

4,649,078

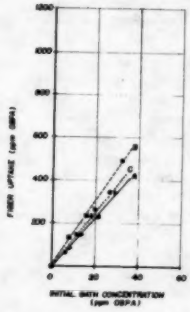
ANTIMICROBIALS IMPREGNATED INTO FIBERS

Thomas C. McEntee; Lawrence J. Guilbault, both of Topsfield; James F. Brophy, N. Reading, and Judith L. Koob, Danvers, all of Mass., assignors to Morton Thiokol, Inc., Chicago, Ill.

Continuation of Ser. No. 657,117, Oct. 3, 1984, abandoned. This application Mar. 21, 1986, Ser. No. 841,499

Int. Cl.[4] B32B *27/00*; D02G *3/00*

U.S. Cl. 428—375 **17 Claims**



1. A product comprising a fiber containing an effective amount of an antimicrobial agent to provide protection against microbial attack of said fiber; said antimicrobial agent being added to said fiber while the fiber is a solid and resulting in said antimicrobial agent being present in an essentially homogeneous cross-sectional distribution throughout said fiber and further characterized by the presence of a greater amount of active antimicrobial agent than if an equal total amount of said agent had been incorporated into said fiber when said fiber was in the molten condition.

4,649,079

METHOD OF INCORPORATING ANTIMICROBIAL AGENTS INTO FIBERS

Lawrence J. Guilbault; Thomas C. McEntee, both of Topsfield; Judith L. Koob, Danvers, and James F. Brophy, North Reading, all of Mass., assignors to Morton Thiokol Inc., Chicago, Ill.

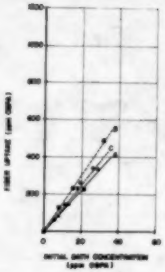
Continuation-in-part of Ser. No. 836,911, Mar. 6, 1986, which is a division of Ser. No. 657,117, Oct. 3, 1984, abandoned. This application Apr. 3, 1986, Ser. No. 847,802

Int. Cl.[4] B32B *27/00*; D02G *3/00*

U.S. Cl. 428—375 **8 Claims**

1. A method for incorporating an antimicrobial agent into a fiber comprising:

treating a fiber which does not contain an antimicrobial agent by passing said fiber into a liquid medium containing a solution of the antimicrobial agent 4,5-dichloro-2-cyclohexyl-3-isothiazolone in a concentration sufficient to cause an effective amount of said agent to be exhausted into the fiber and to be incorporated in an essentially homogeneously cross-sectional distribution throughout



said fiber; said effective amount being sufficient to provide protection against microbial attack of said fiber.

4,649,080

FIBER-REINFORCED MATERIALS

Juergen Fischer, Ludwigshafen; Hartmut Zeiner, Plankstadt; Dietmar Nissen, Heidelberg; Gerhard Heinz, Weisenheim, and Peter Neumann, Wiesloch, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 8, 1985, Ser. No. 731,719

Claims priority, application Fed. Rep. of Germany, May 8, 1984, 3416855; Jan. 11, 1985, 3500707

Int. Cl.[4] B05D *3/02*; B29C *67/00*; B32B *27/06*; C08K *7/02*

U.S. Cl. 428—419 **20 Claims**

16. A fiber-reinforced material containing an effective amount of a heat-stable thermoplastic aromatic polyether which carries reactive sulfur groups, and from 30 to 85% by volume of oriented reinforcing fibers, wherein the plastic matrix is crosslinked via the reactive sulfur groups so that the fiber-reinforced material has a glass transition temperature of greater than 100° C. and is virtually insoluble in low-boiling chlorohydrocarbons.

4,649,081

MAGNETIC RECORDING MEDIUM

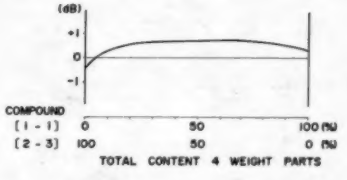
Hiroshi Ogawa; Shinji Saito; Chiaki Mizuno, and Yasuo Tamai, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Oct. 15, 1985, Ser. No. 787,776

Claims priority, application Japan, Oct. 15, 1984, 59-216882

Int. Cl.[4] G11B *5/71*

U.S. Cl. 428—447 **8 Claims**



1. In a magnetic recording medium comprising a nonmagnetic support and a magnetic recording layer provided on said support, said magnetic recording layer comprising a ferromagnetic powder dispersed in a binder, the improvement which comprises said magnetic recording layer containing at least one modified silicon compound having molecular weight in the range of 200–2000 and at least one modified silicon compound having molecular weight in the range of 5,000 to 100,000, the

minimum amount of each modified silicon compound being not less than 10 weight percent based on the total amount of all modified silicon compounds used.

4,649,082

RADIATION CURABLE COMPOSITIONS BASED ON RADIATION CURABLE ESTERS OF POLYFUNCTIONAL HYDROXYL-CONTAINING CARBOXYLIC ACIDS

Charles B. Friedlander, Glenshaw, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 7, 1985, Ser. No. 709,147
Int. Cl.[4] C08F *2/50, 20/20;* B32B *15/08, 27/30*
U.S. Cl. 428—461 27 Claims

1. A nonaqueous, ungelled radiation curable resin which is an ester prepared by reacting components consisting essentially of:

(a) a di- or trialkylol carboxylic acid having a molecular weight less than or equal to 1,000 or a mixture thereof; with

(b) an organic hydroxyl-functional compound selected from the group consisting of (i) simple diols, triols, and higher hydric alcohols, (ii) polyester polyols having a peak molecular weight of less than or equal to 1,000 as determined by gel permeation chromatography using a polystyrene standard, (iii) polyether polyols having a peak molecular weight of less than or equal to 1100 determined by gel permeation chromatography using a polystyrene standard and (iv) a combination thereof; and

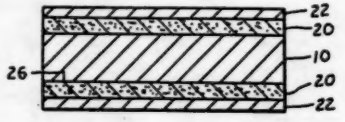
(c) an alpha,beta-ethylenically unsaturated carboxylic acid wherein carboxyl functionality of said di- or trialkylol carboxylic acid is reacted with hydroxyl functionality of said hydroxyl-functional compound, and wherein carboxyl functionality of said alpha,beta-ethylenically unsaturated carboxylic acid is reacted with hydroxyl functionality from said organic hydroxyl-functional compound and/or from said di- or trialkylol carboxylic acid.

4,649,083

ELECTRICAL COMPONENT FORMING PROCESS

Julius C. Fister, Hamden, and John F. Breedis, Trumbull, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 467,616, Feb. 17, 1983, Pat. No. 4,500,605. This application Sep. 19, 1984, Ser. No. 651,977
Int. Cl.[4] C23C *11/00, 11/10*
U.S. Cl. 428—469 8 Claims



1. An article of manufacture performed by the process of:

(a) providing an alloy comprising a first alloy component of about 0.5 to 12% aluminum and the balance being selected from a material from the group consisting of copper and iron;

(b) heating said alloy at a temperature below about 350° C. in an oxygen-rich atmosphere to form a oxide layer of said material on a surface of said alloy; and

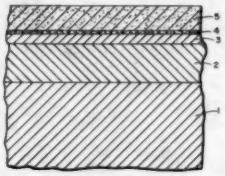
(c) heating said alloy at a temperature between approximately 500° to 850° C. in a reducing atmosphere to reduce said oxygen layer of said material into a layer of said material and to simultaneously form an aluminum oxide layer between said layer of said material and the surface of said alloy.

4,649,084

PROCESS FOR ADHERING AN OXIDE COATING ON A COBALT-ENRICHED ZONE, AND ARTICLES MADE FROM SAID PROCESS

Thomas E. Hale, Warren, and Warren C. Yobe, Mt. Clemens, both of Mich., assignors to General Electric Company, Detroit, Mich.

Filed May 6, 1985, Ser. No. 730,511
Int. Cl.[4] B22F *3/00*
U.S. Cl. 428—552 43 Claims



1. A method of improving the adherence of an oxide coating on a tungsten carbide-based substrate, the composition of which comprises tungsten carbide, cobalt and at least one carbide, nitride or carbonitride of titanium, and at least one carbide, nitride or carbonitride of tantalum, niobium or mixtures thereof, comprising the steps of:

(a) sintering the substrate in nitrogen gas at a temperature at or above the melting point of the cobalt phase for a period of time sufficient to cause the formation of a B-1 phase enriched layer on the surface of the sintered substrate;

(b) oxidizing the surface of the substrate; and

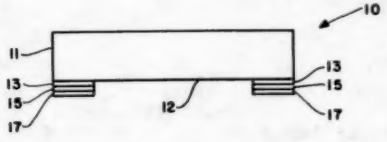
(c) depositing an oxide wear layer on the oxidized surface.

4,649,085

CRYOGENIC GLASS-TO-METAL SEAL

Mark O. Landram, Florissant, Mo., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 29, 1984, Ser. No. 645,389
Int. Cl.[4] H01L *29/12*
U.S. Cl. 428—620 7 Claims



1. A low temperature vacuum seal structure, wherein an optical material selected from the group consisting of silica, glass, quartz, and semiconductor material is joined to a element of metal or alloy, comprising:

(a) a first thin layer of metal on said optical material to provide substantial adhesion to said optical material, said first layer comprising a material selected from the group consisting of titanium, chromium, copper, zinc and tin;

(b) a second thin layer of metal on said optical material over said first layer to provide solderability to said optical material, said second layer comprising a material selected from the group consisting of platinum, nickel and copper;

(c) a third layer of metal on said element in registration with said first and second layers to provide solderability to said

element, said third layer comprising a material selected from the group consisting of titanium, chromium, copper, zinc and tin;

(d) a layer of solder between said optical material and element and interfacing the lastly applied layer on said optical material element and said third layer on said element; and,

(e) wherein adjacent layers, including said element, consist essentially of different materials.

4,649,086

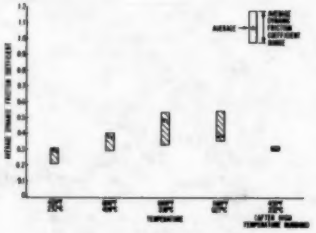
LOW FRICTION AND GALLING RESISTANT COATINGS AND PROCESSES FOR COATING

Roger N. Johnson, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 21, 1985, Ser. No. 703,856

Int. Cl.[4] B32B *15/04*

U.S. Cl. 428—627 **27 Claims**



1. A coated article of manufacture comprising:

a substrate selected from the groups consisting of iron base alloys and nickel base alloys;

a coating metallurgically bonded to said substrate and having a thickness between 7.5 and 100 microns;

said coating formed by the process steps comprising:

electro-spark depositing a first material from a cemented carbide electrode consisting essentially of chromium carbide in a matrix selected from the group consisting of nickel and binary nickel—chromium alloys, said matrix forming about 5 to 25 wt.% of said cemented carbide electrode, whereby a layer of said first material is deposited on said substrate and is alloyed therewith;

and electro-spark depositing a second material from an electrode selected from the group consisting of aluminum, aluminum alloys containing at least 95 wt.% aluminum, and nickel—molybdenum—chromium alloys containing greater than 20 wt.% molybdenum, whereby a layer of said second material is deposited on said layer of said first material and is alloyed therewith;

and said coating formed by said process characterized by a combination of excellent wear resistance and a low average dynamic friction coefficient when in rubbing contact with an identically coated component in a liquid, low oxygen, sodium environment at temperatures below about 650° C.

4,649,087

CORROSION RESISTANT ALUMINUM BRAZING SHEET

Darwin H. Scott, Mechanicsville, and Kenneth D. Wade, Richmond, both of Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Jun. 10, 1985, Ser. No. 742,892

Int. Cl.[4] B32B *15/20*

U.S. Cl. 428—654 **17 Claims**

8. An aluminum brazing sheet having a core alloy and a brazing alloy clad on at least one face of the core alloy, the improvement wherein said core alloy, by weight percent, consists essentially of 0.11 to 0.30% titanium, 0.3 to 1.5% manganese, 0.4 to 0.6% copper, up to 0.7% iron, up to 0.8% silicon, up to 1.5% magnesium, with the balance being aluminum and normal impurities.

4,649,088

ANTIREFLECTIVE FILM FOR PHOTOELECTRIC DEVICES

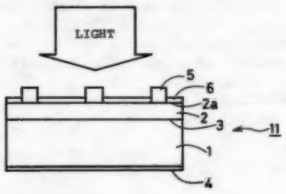
Kotaro Mitsui; Mari Kato; Takao Oda, and Susumu Yoshida, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1985, Ser. No. 705,117

Claims priority, application Japan, Apr. 2, 1984, 59-66891

Int. Cl.[4] B32B *9/00, 19/00*

U.S. Cl. 428—697 **8 Claims**



1. An antireflective film, for coating a light-receiving or a light-emitting photoelectric surface, characterized in that:

said film contains at least one layer comprising a nitride, an oxynitride and an oxide of an element selected from the group consisting of tantalum, aluminum and silicon, such that in said layer the local oxygen content is smallest closest to said surface, the local nitrogen content is smallest farthest away from said surface, and the local oxygen-to-nitrogen ratio varies continuously with distance across the thickness of said layer therebetween.

4,649,089

INTUMESCENT MATERIALS

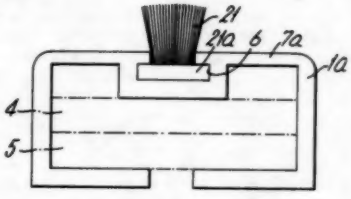
Peter J. Thwaites, Eltisley, England, assignor to Dufaylite Developments Limited, St. Neots, England

Filed Oct. 9, 1985, Ser. No. 785,669

Claims priority, application United Kingdom, Oct. 9, 1984, 8425454

Int. Cl.[4] E16J *15/00*; E06B *7/16*

U.S. Cl. 428—913 **7 Claims**



1. A fire resistant assembly consisting of an elongate casing, an elongate brush having a base and bristles projecting to one side thereof, and at least one elongate preformed strip of intumescent material, the assembly being designed for the normal sealing of a gap and the intumescent material and the casing being adapted to react to fill the gap under fire conditions, wherein the casing is a body of generally tubular cross-section made of thermoplastic material and having formed along one face a first longitudinal slot for locating the brush therein with bristles of the brush projecting from the face, a partition ex-

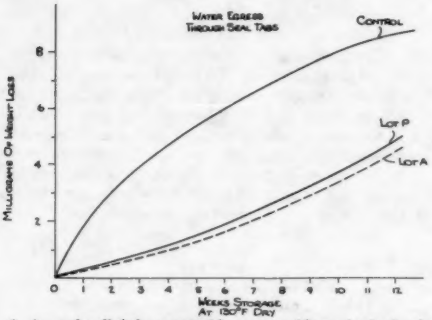
tending internally along the casing and having a base spaced from the slot and side walls joining the base to the body at positions spaced from the slot thereby providing, between the side walls and the slot, a pair of projections for securing the base of the brush between the partition and the slot with the bristles extending outwardly through the slot and the base within the casing, and having a second longitudinal slot formed in the wall of the body on the side of the partition opposite the side having the first slot, and isolated from the first slot by the partition, and the at least one strip of intumescent material being located within the casing on the side of the partition opposite the brush.

4,649,090

SEAL TAB FOR A METAL-AIR ELECTROCHEMICAL CELL

John E. Oltman, Mt. Horeb; Robert B. Dopp, and Denis D. Carpenter, both of Madison, all of Wis., assignors to Rayovac Corporation, Madison, Wis.

Filed Jan. 22, 1986, Ser. No. 821,430
Int. Cl.[4] H01M 12/06; C09U 7/02
U.S. Cl. 429—29 **12 Claims**



1. An only slightly permeable, removable seal tab, having high initial tack, used to cover the air entry ports of a metal-air electrochemical cell between the time said cell is manufactured and the time said cell is used as a source of electrical power, which comprises a face stock of biaxially-oriented three-ply polypropylene paper interposed between an acrylic adhesive and a plastic film.

8. A metal-air electrochemical cell wherein a seal tab according to claim 1 has been mechanically affixed to said cell in such a manner as to cover the air entry port or ports of said cell.

4,649,091

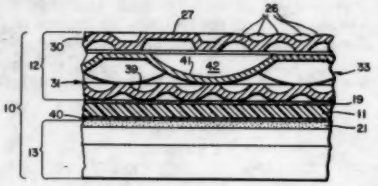
FUEL CELL BATTERY WITH IMPROVED MEMBRANE COOLING

James F. McElroy, Hamilton, Mass., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 391,800, Jun. 23, 1982, abandoned. This application Feb. 3, 1984, Ser. No. 576,675
Int. Cl.[4] H01M 2/00, 8/04
U.S. Cl. 429—34 **2 Claims**

1. An electrically conductive bipolar separator element for electrochemical cells comprising a nonperforated electrically conductive wall members having projections theron for contacting electrodes of said cells, said wall members defining an interior coolant chamber for said separator,

(a) means for communicating with the interior of said chamber to permit introduction and removal of coolant,



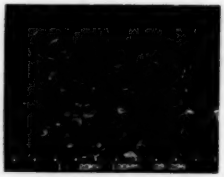
(b) means positioned in said interior chamber to produce differential coolant flow rates along walls of said chamber to produce differential cooling of said bipolar separator.

4,649,092

CADMIUM NEGATIVE ELECTRODE

Victor A. Chang, Miami; Angel A. Reyes, North Miami; Martin P. Jegers, Davie, and Frantz Valias-Jean, Lauderhill, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 7, 1985, Ser. No. 689,352
Int. Cl.[4] H01M 4/24
U.S. Cl. 429—217 **15 Claims**



1. An improved cadmium electrode comprising a substrate for current distribution, associated therewith an admixture of cadmium oxide and cadmium metal flakes, said flakes having a thickness of less than about one micron, an apparent density about 1.34 gm/Am3 and having a surface area approaching 0.465 m2/gm.

4,649,093

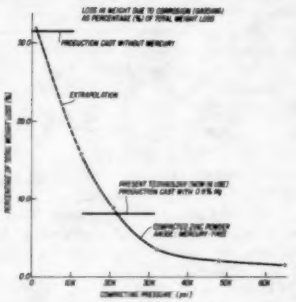
CORROSION RESISTANT MERCURY-FREE ZINC ANODE BATTERY

Viet Vu, Milwaukee, and Paul F. Hettwer, Greenfield, both of Wis., assignors to Sab Nife Inc., Lincoln, R.I.

Filed Mar. 14, 1986, Ser. No. 839,716
Int. Cl.[4] H01M 4/02
U.S. Cl. 429—229 **14 Claims**

1. An electrochemical cell comprising a zinc electrode in an electrolyte solution, said electrode being formed from a zinc

powder compacted to a density of about 6.5 g/cc or greater, whereby corrosion of the zinc electrode and the evolution of



hydrogen gas therefrom during discharge are substantially suppressed.

4,649,094

IMAGE FORMATION METHOD AND APPARATUS IN WHICH IMAGING LIGHT AND CONDUCTIVE TONER ARE APPLIED TO OPPOSITE SURFACES OF A PHOTOSENSITIVE MEMBER

Yasuyuki Tamura, Kawasaki; Shuzo Kaneko, and Tohru Takahashi, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1982, Ser. No. 445,070

Claims priority, application Japan, Dec. 8, 1981, 56-197410; Dec. 8, 1981, 56-197412; Dec. 8, 1981, 56-197413

Int. Cl.⁴ G03G *13/24*

U.S. Cl. 430—126 **20 Claims**

1. A method for forming a toner image on a photosensitive member, the image corresponding to light information applied to the photosensitive member, said method comprising the steps of:

providing a two-sided photosensitive member having a photoconductive layer and a conductive layer;

applying light information to said photosensitive member from the side;

supplying conductive toner to the photoconductive layer side of the photosensitive member and opposite to the side to which the light information is applied;

simulaneously applying a bias voltage between the conductive layer of the photosensitive member and the supplied toner so that at the region where the light information has been applied, carriers having a polarity opposite to the polarity of the toner are moved within the photoconductive layer toward the toner so as to adhere toner on the surface of the photosensitive member to form a toner image corresponding to said light information; and

terminating the application of light information before separating the toner supply from the photosensitive member.

4,649,095

COLOR DIFFUSION TRANSFER PHOTOGRAPHIC FILM UNIT CONTAINING ALUMINUM COMPOUND

Osamu Takahashi, and Minoru Sakai, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 658,935, Oct. 9, 1984, abandoned. This application Sep. 23, 1985, Ser. No. 778,757

Claims priority, application Japan, Oct. 6, 1983, 58-187405

Int. Cl.⁴ G03C *5/54, 7/00*

U.S. Cl. 430—216 **5 Claims**

1. A nonseparation monosheet integrated type color diffusion transfer photographic film unit comprising

(a) a light-sensitive element comprising a support having provided thereon in this order an image receiving layer, a white reflection layer and at least one silver halide emulsion layer associated with a dye providing compounds capable of forming or releasing a diffusible dye as a result of development;

(b) a cover sheet;

(c) at least one neutralizing layer; and

(d) a container provided between the emulsion layer of the light-sensitive element and the cover sheet, containing a filter agent-free alkali processing composition which contains an aluminum compound which produces aluminic acid anions in the alkali processing composition having a high pH value, but produces aluminum cations with the neutralization of alkali.

4,649,096

PROCESSING COMPOSITIONS FOR SILVER COMPLEX DIFFUSION TRANSFER PROCESS

Yasuo Tsubai; Koji Okazaki; Shoichi Horii, and Akio Yoshida, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Apr. 2, 1985, Ser. No. 719,132

Claims priority, application Japan, Apr. 6, 1984, 59-69551; Apr. 6, 1984, 59-69552

Int. Cl.⁴ G03C *5/54, 5/30, 5/38*

U.S. Cl. 430—249 **16 Claims**

1. A processing composition for silver complex diffusion transfer process which contains the following constituents (A) to (E):

(A)	MOH (M is an alkali metal)	0.05–0.2 mole/l
(B)	an alkanolamine	0.25–0.7 mole/l
(C)	a sulfite	0.4–0.7 mole/l
(D)	a thiosulfate	0.03–0.08 mole/l
(E)	a p-dihydroxybenzene	≧0.07 mole/l

the sum of (A) and (B) being 0.4 to 0.8 mole/l and the molar ratio of (B) to (A) being above 2.0, the alkali component of the processing composition consisting essentially of said constituents (A) and (B).

4,649,097

CORONA DISCHARGE APPARATUS AND METHOD FOR CORONA DISCHARGE TREATMENT

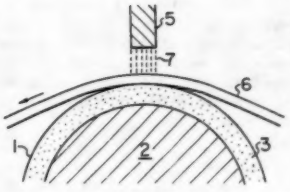
Satoshi Tsukada, and Kazuhisa Taguchi, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills Ltd., Tokyo, Japan

Continuation of Ser. No. 490,112, Apr. 29, 1983, abandoned. This application Jun. 12, 1985, Ser. No. 743,779

Claims priority, application Japan, May 31, 1982, 57-92770; Jun. 29, 1982, 57-112105; Feb. 25, 1983, 58-27671[U]

Int. Cl.⁴ G03C *1/76*

U.S. Cl. 430—270 **18 Claims**



1. A method for coating a hydrophilic colloid-containing layer on a web which comprises hydrophilizing a hydrophobic surface of the web by corona treating the hydrophobic surface with a corona discharge apparatus having a discharge electrode and a grounded roller, wherein the grounded roller or the discharge electrode, which is in roller form, is a metal

roller clad with an insulating layer comprising a rubber which contains a powdered high-permittivity substance which has a relative permittivity of at least 20 and thereafter coating the thus hydrophilized surface of the web with a hydrophilic colloid-containing layer.

10. A method according to claim 1, wherein the hydrophilic colloid-containing layer is a photographic layer.

4,649,098

IMAGE RECORDING PROCESS USING BOTH SILVER HALIDE AND VINYL MONOMERS

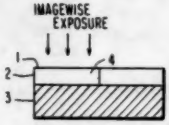
Keiji Takeda, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Sep. 23, 1985, Ser. No. 778,653

Claims priority, application Japan, Sep. 21, 1984, 59-198196

Int. Cl.[4] G03C 1/76

U.S. Cl. 430—270 **19 Claims**



1. An image recording process which comprises forming a latent image by imagewise exposure of light-sensitive silver halide, developing the latent image with a reducing agent selected from the group consisting of polyhydroxybenzenes, alkoxyphenols, 1-phenyl-3-pyrazolidones and aromatic amines which has a function as a developing agent for silver halide and a function as a polymerization inhibitor for polymerizable vinyl monomer, but loses the function as a polymerization inhibitor after development of silver halide, to result in a state that polymerization of the polymerizable vinyl monomer is inhibited by the residual reducing agent, and thereafter conducting substantially uniform light exposure to cause photopolymerzation of the polymerizable vinyl monomer in the part where said reducing agent is not present, in the presence of a photopolymerization initiator, whereby a polymer image corresponding to said latent image is formed.

4,649,099

NEGATIVE-TYPE RESIST SENSITIVE TO IONIZING RADIATION

Kiyoshi Oguchi, Sayama, Japan, assignor to Dai Nippon Insatsu K.K., Tokyo, Japan

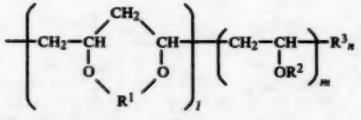
Division of Ser. No. 575,545, Jan. 31, 1985, abandoned, which is a continuation-in-part of Ser. No. 432,449, Oct. 4, 1982, abandoned. This application Jul. 22, 1985, Ser. No. 757,475

Claims priority, application Japan, Oct. 9, 1981, 56-161430

Int. Cl.[4] G03C 5/16; G03F 7/26

U.S. Cl. 430—323 **3 Claims**

1. An ionizing radiation lithography process, which comprises forming on a substrate a thin film of a resist comprising an acetalized polyvinyl alcohol polymer having a molecular weight of 10,000 to 1,000,000 represented by the formula:



wherein:

R^1 represents a residue of an aldehyde or a ketone, the residue having no photosensitivity to ultraviolet rays;

R^2 represents a hydrogen atom, which may partially be substituted with an acetyl group;

R^3 represents naught or a monomeric unit copolymerizable with vinyl acetate; and l, m, n are integers indicating polymerization degrees,

subjecting the thin film of said resist to imagewise irradiation by ionizing radiation, dissolving away selectively the non-irradiated portions of the resist film to expose corresponding portions of the substrate, and etching selectively the exposed portions of the substrate.

4,649,100

PRODUCTION OF RESIST IMAGES, AND A SUITABLE DRY FILM RESIST

Reinhold J. Leyrer, Ludwigshafen; Gerhard Wegner, Deuzlingen, and Michael Mueller, Waldkirch, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 27, 1984, Ser. No. 675,428

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1983, 3342829; Dec. 23, 1983, 3346716

Int. Cl.[4] G03C 1/495, 5/16; G03F 7/26

U.S. Cl. 430—326 **24 Claims**

1. A process for the porduction of a resist image on a substrate, comprising

application of a solid radiation-sensitive resist layer onto the substrate, the said resist layer being mainly or completely composed of at least one poly(diacetylene),

imagewise exposure of the resist layer to actinic radiation, resulting in molecular degradation of the poly(diacetylene), and

selective removal of the irradiated parts of the resist layer with development ofthe resist image.

16. The process of claim 1, wherein the resist image is aftertreated by drying and/or heating the developed image.

4,649,101

PROCESS FOR THE PRODUCTION OF PHOTORESIST RELIEF STRUCTURES HAVING AN OVERHANG CHARACTER USING O-QUINONE DIAZIDE PHOTORESIST WITH OVEREXPOSURE

Klaus P. Thiel, Brensbach-Wersau; Raimund Sindlinger, Ober-Ramstadt, and Hans J. Merrem, Seeheim, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Jul. 26, 1985, Ser. No. 759,572

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1984, 3427556

Int. Cl.[4] G03F 7/26

U.S. Cl. 430—326 **10 Claims**

1. A process for the production of photoresist relief structures, comprising:

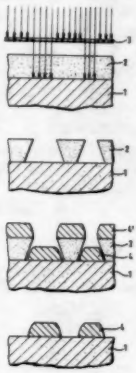
(a) coating a substrate with a positive-working photoresist composition comprising an admixture of a phenol/formaldehyde condensate of the novolak type and a photosensitive o-quinoediazide compound, so as to obtain a single photoresist layer,

(b) imagewise overexposing the single dried photoresist layer, at a sufficient exposure energy of 15–25 mJ/cm^2 so that the resulting side walls of the relief structure resulting after development of the exposed layer will have an overhang structure wherein the sidewalls of the relief structure form an angle of about 95°–120° with the substrate surface, and

(c) treating the exposed photoresist layer with a buffered, aqueous alkaline developer containing 1–100 ppm of an oxyethylated alkylphenol non-ionic surfactant, whereby an image is produce in the coating on the substrate.

10. In a method for obtaining a latent image in a substrate containing a single photoresist layer, the photoresist being a composition comprising an admixture of a phenol/formaldehyde condensate of the novolak type and a photosensitive

o-quinonediazide compound, said method comprising generating the image by exposing the dried photoresist layer and subsequently developing the layer, whereby an image is produced in the coating on the substrate, the improvement comprising overexposing the single photoresist layer at a sufficient exposure energy of 15–25 mJ/cm^2 so that the side walls of the



relief structure resulting after development of the exposed layer will have an overhang character wherein the sidewalls of the relief structure form an angle of about 95°–120° with the substrate surface, and subsequently developing the photoresist layer in a developer containing 1–100 ppm of an oxyethylated alkylphenol non-ionic surfactant.

4,649,102

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Yasuo Mukunoki; Shigeki Yokoyama; Hiroshi Kawasaki; Ryoichi Nemori, all of Kanagawa, and Tetsuo Takeuchi, Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 657,280, Oct. 3, 1984, abandoned. This application Jan. 10, 1986, Ser. No. 817,648

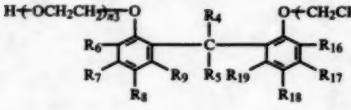
Claims priority, application Japan, Oct. 3, 1983, 58-184727; Oct. 3, 1983, 58-184728

Int. Cl.[4] G03C 1/94

U.S. Cl. 430—527 **12 Claims**

1. A silver halide photographic light-sensitive element comprising a support having provided thereon at least one silver halide emulsion layer, said element containing in one or more of a silver halide emulsion layer, a subbing layer, an intermediate layer, a surface protecting layer, an overcoat layer or a backing layer:

(A) from about 1 to 1,000 mg per m^2 of the photographic light-sensitive material of at lease one nonionic surface active agent represented by formula (I-3):



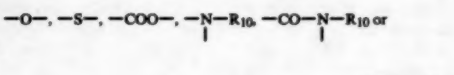
(I-3)

wherein R_4 and R_5 each represents a hydrogen atom, a substituted or unsubstituted alkyl group having from 1 to 30 carbon atoms or a substituted or unsubstituted aryl group having from 7 to 30 carbon atoms, or R_4 and R_5 together form a substituted or unsubstituted ring; R_6, R_8, R_{16}, and R_{18} each represents a substituted or unsubstituted alkyl group having from 1 to 30 carbon atoms, a substituted or unsubstituted aryl group having from 6 to 30 carbon atoms, or a substituted or unsubstituted alkoxy group having from 1 to 30 carbon atoms, a halogen atom, an acyl group, an amido group, a sulfonamido group, a carbamoyl group, or a sulfamoyl group; R_7, R_9, R_{17} and R_{19} each represents a hydrogen atom, a substituted or unsubstituted alkyl group having from 1 to 30 carbon atoms, a substituted or unsubstituted aryl group having from 6 to 30 carbon atoms, or a substituted or unsubstituted alkoxy group having from 1 to 30 carbon atoms, a halogen atom, an acyl group, an amido group, a sulfonamido group, a carbamoyl group, or a sulfamoyl group; or R_6 and R_7, R_8 and R_9, R_{16} and R_{17}, or R_{18} and R_{19} together form a substituted or unsubstituted ring; and n_3 and n_4, which may be the same or different, each represents an average degree of polymerization of the ethylene oxide moiety ranging from 2 to 50; and

(B) from about 1 to 1,000 mg per m^2 of the photographic light-sensitive material of at least one anionic surface active agent represented by formula (II):

$$R_1—A—(CH_2CH_2O)_{n5}B—D \qquad \text{(II)}$$

wherein R_1 represents a substituted or unsubstituted alkyl group having from 1 to 30 carbon atoms, a substituted or unsubstituted alkenyl group having from 2 to 30 carbon atoms or a substituted or unsubstituted aryl group having, from 6 to 30 carbon atoms; A represents



wherein R_{10} represents a hydrogen atom or a substituted or unsubstituted alkyl group having from 1 to 30 carbon atoms; B represents a substituted or unsubstituted alkyl group having from 1 to 30 carbon atoms, a substituted or unsubstituted alkenyl group having from 2 to 30 carbon atoms or a substituted or unsubstituted aryl group having from 6 to 30 carbon atoms; D represents an anion group; and n_5 represents an average degree of polymerization ranging from 1 to 50.

4,649,103

HEAT-DEVELOPABLE LIGHT-SENSITIVE MATERIAL

Yoshiharu Yabuki; Kozo Sato; Ken Kawata, and Hiroyuki Hirai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

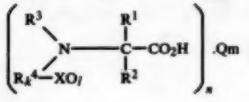
Filed Aug. 26, 1985, Ser. No. 769,299

Claims priority, application Japan, Aug. 25, 1984, 59-176999

Int. Cl.[4] G03C 1/02

U.S. Cl. 430—570 **7 Claims**

1. A heat-developable light-sensitive material comprising a support having thereon a silver halide emulsion layer and a reducing agent, wherein at least one layer contains at least one base precursor represented by the following formula (I):



(I)

wherein X represents a carbon atom, a nitrogen atom or a sulfur atom; R^1 and R^2 a hydrogen atom, a halogen atom, an alkyl group, an alkenyl group, an alkynyl group, a cycloalkyl group, an aralkyl group, an aryl group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, a heterocyclic group, an acylamino group, an alkylsulfinyl group, an

arylsulfinyl group, a nitro group, an acyl group, a sulfamoyl group, a substituted sulfamoyl group, a carbmoyl group, a substituted carbamoyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, a $-CO_2H.Q$ group (Q represents a base described below), a

group, a

group (R represents an alkyl group or an aryl group) or a hydroxy group; R^3 and R^4 represent a hydrogen atom, an alkyl group, an alkenyl group, an alkynyl group, a cycloalkyl group, an aralkyl group, an aryl group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, a heterocyclic group or an acyl group; the alkyl group and the aryl group may have a substitutent; at least two of R^1, R^2, R^3 and R^4 may combine with each other to make a ring; k represents 0 or 1; l represents an integer of 1 or 2; between k and l there is a numerical relation such that the valencies of X, R^4 and an oxygen atom balance each other; Q is a base; n and m represent an integer of 1 or 2 and between n and m there is a numerical relation such that the value of a plus valency and a minus valency are equal in the base precursor.

4,649,104

HEAT DEVELOPABLE LIGHT-SENSITIVE MATERIAL

Taku Nakamura, and Hiroyuki Hirai, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

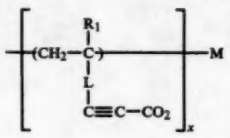
Filed Oct. 30, 1985, Ser. No. 793,055

Claims priority, application Japan, Oct. 30, 1984, 59-228551

Int. Cl.[4] G03C *1/06*

U.S. Cl. 430—617 **18 Claims**

1. A heat developable light-sensitive material comprising a silver halide emulsion, a reducing substance and a polymer base precursor containing as a constituent a repeating unit represented by formula (I)



(I)

wherein R_1 represents a hydrogen atom or a substituted or unsubstituted alkyl group having from 1 to 6 carbon atoms; L represents a divalent connecting group having from 1 to 20 carbon atoms; M represents a cation; and x represents a number which is the same as the charge number of the cation represented by M.

4,649,105

METHOD OF MEASURING BIOLOGICAL LIGAND

Yasushi Kasahara; Yoshihiro Ashihara, and Hiromasa Suzuki, all of Tokyo, Japan, assignors to Fujirebio Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1984, Ser. No. 603,499

Claims priority, application Japan, Apr. 30, 1983, 58-77255

The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.

Int. Cl.[4] G01N *33/543, 33/545, 33/569, 33/574*

U.S. Cl. 435—5 **14 Claims**

1. A method of measuring a biological ligand which comprises the steps of:

(a) forming a biologically active composition by:

(i) immobilizing on a first solid phase an antibody or an antibody fragment capable of reacting with the ligand (1) to be measured;

(ii) immobilizing on a second solid phase a biotinyl enzyme;

(b) contacting said biologically active composition with:

(1) an aqueous solution of a biological ligand (2) capable of reacting with said antibody or said antibody fragment, said biological ligand (2) being conjugated to a biotinyl enzyme inhibitor capable of reacting with said biotinyl enzyme;

(2) the ligand (1) to be measured; and

(c) measuring the biotinyl enzyme activity of said biologically active composition or the biotinyl enzyme inhibitory activity of said aqueous solution.

4,649,106

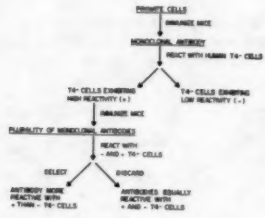
DISTINGUISHING SUBSETS OF HUMAN CELLS

Stuart F. Schlossman, Newton Center, and Chikao Morimoto, Needham, both of Mass., assignors to Dana-Farber Cancer Institute, Inc., Boston, Mass.

Filed Jun. 1, 1984, Ser. No. 616,284

Int. Cl.[4] G01N *33/53, 33/554*

U.S. Cl. 435—7 **7 Claims**


PRIMATE CELLS
IMMUNIZE MICE
MONOCLONAL ANTIBODY
REACT WITH HUMAN T4+ CELLS
T4+ CELLS EXHIBITING HIGH REACTIVITY (+)
T4+ CELLS EXHIBITING LOW REACTIVITY (-)
IMMUNIZE MICE
PLURALITY OF MONOCLONAL ANTIBODIES
REACT WITH - AND + T4+ CELLS
SELECT
DISCARD
ANTIBODY MORE REACTIVE WITH + THAN - T4+ CELLS
ANTIBODIES EQUALLY REACTIVE WITH + AND - T4+ CELLS

1. A method of distinguishing subsets within a plurality of human cells comprising

producing a monoclonal antibody to a non-human primate cell,

contacting said monoclonal antibody with said human cells, and

distinguishing said subsets on the basis of different degrees of reactivity with said monoclonal antibody.

4,649,107

PHENYLETHANOLAMINE N-METHYLTRANSFERASE BASED RADIOENZYMATIC ASSAY FOR NOREPHINEPHRINE

Ronald R. Bowsher, Beech Grove, and David P. Henry, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jul. 2, 1984, Ser. No. 627,319
Int. Cl.[4] C12Q *1/48*
U.S. Cl. 435—15 6 Claims

1. A method for quantifying norepinephrine comprising the following steps:

A. incubating a mixture comprising an appropriate norepinephrine containing sample, substantially purified phenylethanolamine N-methyltransferase essentially free from foreign contaminants including thio S-methyltransferase and of sufficient purity so as to be suitable for use in radioenzymatic assays, S-adenosylmethionine and a suitable buffer at a temperature in the range of about 20° C. to about 45° C. for a period of about 10 to 60 minutes;

B. terminating the reaction by the addition of a potassium phosphate buffer containing a reducing agent to the mixture in (A);

C. adding alumina to the mixture in (B) to provide an alumina-tritiated epinephrine complex;

D. washing the alumina-tritiated epinephrine complex in (C) with water and separating the alumina from the tritiated epinephrine by elution with a suitable acid solution;

E. adding phosphotungstic acid to the solution in (D) containing tritiated epinephrine;

F. combining the supernatant in (E) with a phosphate buffer, bis(2-ethylhexyl)hydrogen phosphate and a counting scintillator; and

G. counting the radiation emitted from the tritiated epinephrine contained in the mixture in (F).

4,649,108

ALPHA AMYLASE ASSAY

Henry E. Blair, Barnstable, Mass., assignor to Genzyme Corporation, Boston, Mass.

Filed Jul. 26, 1984, Ser. No. 634,873
Int. Cl.[4] C12Q *1/40, 1/66, 1/54, 1/34*
U.S. Cl. 435—22 17 Claims

1. A method of measuring the amount of α-amylase in a liquid sample comprising the steps of

providing an oligosaccharide substrate for α-amylase, said substrate being characterized in that

it contains at least 3 glucose units,

the reducing-end glucose unit is bonded, via a bond cleavable by α- or β-glucosidase, to a label which exhibits an optically measurable change upon cleavage of said bond, and

the terminal glucose unit is bonded to a chemical blocking substituent which inhibits cleavage by exo-enzymes of the bond between said terminal glucose unit and the adjacent glucose unit,

contacting said sample with said oligosaccharide substrate and with a first added exo-enzyme capable of cleaving the bond between said reducing-end glucose unit and said label, and a second added exo-enzyme, capable of cleaving bonds between glucose units, to form a mixture comprising said substrate, said first exo-enzyme, and said second exo-enzyme and

measuring said optically measurable change as a measure of said α-amylase in said sample.

4,649,109

METHODS FOR ISOLATING MUTANT MICROORGANISMS FROM PARENTAL POPULATIONS

Daniel Perlman, Arlington, Mass., assignor to Brandeis University, Waltham, Mass.

Filed Feb. 16, 1984, Ser. No. 580,854
Int. Cl.[4] C12P *1/24*
U.S. Cl. 435—30 16 Claims

1. A method for isolating a mutant microorganism, which method comprises the steps of:

a. separately microencapsulating in a semi-permeable membrane each or a small number of microorganisms from a microorganism population containing said mutant;

b. growing said microencapsulated microorganisms and treating them to induce a difference in cell number between microcapsules containing mutant microorganisms and those containing non-mutant microorganisms; and

c. separating said microcapsules containing mutant micoorganisms from those containing non-mutant microorganisms by a method based on said difference in cell numbers.

4,649,110

POLYMERIC SUBSTANCE, AND METHOD OF SEPARATING AND CULTURING BACTERIA TO PROVIDE POLYMERIC SUBSTANCE USEFUL IN LIQUID CLARIFICATION AND SOIL CONDITIONING

Moshe Shilo, Jerusalem, and Ali Fattom, Maale Hagalil, both of Israel, assignors to Solmat Systems, Ltd., Yavne, Israel

Continuation of Ser. No. 403,047, Jul. 29, 1982, abandoned. This application Jul. 26, 1984, Ser. No. 634,535
Int. Cl.[4] C12P *21/00, 19/04;* C12N *1/12;* C12R *1/89;* A01G *1/04*
U.S. Cl. 435—68 13 Claims

1. A process for culturing cyanobacteria of the Phormidium genus to form polymeric substance comprising the steps of:

(a) culturing said cyanobacteria for a predetermined period of time in a medium suitable for exponential growth of said cyanobacteria, said medium comprising an amount of calcium ions; and

(b) thereafter reducing the amount of calcium ions in said medium available to said cyanobacteria so as to enhance excretion of said polymeric substance by said cyanobacteria.

4,649,111

PROCESS FOR THE PREPARATION OF 5-RIBONUCLEOTIDES

Reinhold Keller, Bad Soden am Taunus, and Merten Schlingmann, Königstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 418,397, Sep. 15, 1982, abandoned. This application Aug. 12, 1985, Ser. No. 764,967
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1981, 3136940
Int. Cl.[4] C12P *19/30;* C12N *11/02, 11/08*
U.S. Cl. 435—89 7 Claims

1. A process for preparing 5'-ribonucleotides by the selective hydrolysis of ribonucleic acid (RNA) having a molecular weight between 10,000 and 50,000 in the presence of desoxyribonucleic acid (DNA) having a molecular weight significantly greater than 100,000 and which is not hydrolyzed by the process, which process comprises contacting a solution of crude nucleic acids, containing said RNA and DNA, obtained by the aqueous extraction of microorganisms which have priorly been extracted with ammonia and a lower alcohol to remove lipids therefrom, with a polymer carrier consisting of glycidylmethacrylate, allylglycidylether, methacrylamide and methylene-bismethacrylamide, on which a 5'-phosphodiesterase has been immobilized, said 5'-phosphodiesterase in its free form hydrolyzing both RNA and DNA at about the same rate.

4,649,112

UTILIZATION OF XYLAN AND CORN FIBER FOR DIRECT FERMENTATION BY CLOSTRIDIUM ACETOBUTYLICUM

Rathin Datta, Chicago, and Steven A. Lemmel, Bolingbrook, both of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Oct. 11, 1984, Ser. No. 659,931
Int. Cl.[4] C12P 7/40, 7/28, 7/16; C12R 1/145
U.S. Cl. 435—136 8 Claims

1. A process for producing products selected from the group consisting of acetone, butanol and fatty acid, comprising fermenting an aqueous medium with a biologically pure culture of *clostridium acetobutylicum*, wherein the carbohydrate source is xylan, in a direct fermentation process without prior hydrolysis of said xylan.

4,649,113

ALKALINE PEROXIDE TREATMENT OF NONWOODY LIGNOCELLULOSICS

John M. Gould, Brimfield, Ill., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Dec. 28, 1983, Ser. No. 566,380
Int. Cl.[4] C12P 7/10; C13K 1/02; D21C 3/00; D01C 1/00
U.S. Cl. 435—165 17 Claims

1. A method for treating a lignocellulosic substrate comprising, treating a substrate selected from the group of leaves and stalks and mixtures thereof from nonwoody plants in a reaction medium comprising an aqueous solution of strong alkali and hydrogen peroxide at a controlled pH in the range of about 11.2 to about 11.8 until substantially all of the polysaccharide in said substrate has been made available as a water-insoluble fraction, and recovering said water-insoluble polysaccharide fraction from said reaction medium.

11. A method as described in claim 1 and further comprising digesting said water-insoluble polysaccharide fraction to a fermentable substrate.

12. A method as described in claim 11 wherein said fermentable substrate is fermented by an ethanol-producing organism.

4,649,114

OXYGEN PERMEABLE MEMBRANE IN FERMENTER FOR OXYGEN ENRICHMENT OF BROTH

Herbert G. Miltenburger, Darmstadt, and Sigfried Hessberg, Melsungen, both of Fed. Rep. of Germany, assignors to Intermedicat GmbH, Emmenbrücke, Switzerland

Continuation of Ser. No. 185,668, Sep. 10, 1980. This application Dec. 3, 1982, Ser. No. 446,644
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1979, 2940446
Int. Cl.[4] C12N 5/00, 5/02; C12M 3/00, 3/02, 1/06; B01D 13/00, 29/42, 29/48
U.S. Cl. 435—240 16 Claims

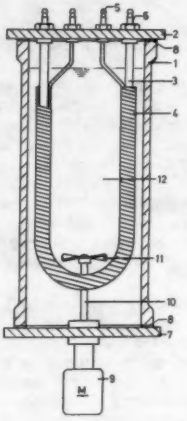
1. In a fermentation vessel for propagating animal cells in suspension cultures and monolayer cultures in which oxygen must be supplied to the cells in a liquid nutrient medium in the vessel for cell metabolism and multiplication, the improvement comprising a permeable membrane partially defining a chamber or volume in the fermentation vessel and made of a polymeric material on which the cells do not grow to a significant extent but through which oxygen can diffuse directly, without bubbling, into at least a 4 liter volume of the liquid nutrient medium containing the cells;

the membrane being of a size and shape so that a sufficient amount of oxygen is diffused into the liquid so as to enable cell propagation;

conduit means communicating with the chamber from outside the vessel for supplying oxygen to the chamber for diffusion through the membrane; and

mechanical liquid-agitation means located within the fermentation vessel.

7. A method comprising growing animal cells in suspension cultures and monolayer cultures in a fermentation vessel containing at least a 4 liter volume of a liquid nutrient medium, and supplying the cells with oxygen through a permeable membrane partially defining a chamber or volume in the fermentation vessel and made of a polymeric material on which almost no cell growth takes place, so that the oxygen diffuses directly without bubbling into the liquid medium;



the oxygen being supplied to the chamber from outside the vessel; and

the membrane being of a size and shape so that a sufficient amount of oxygen is diffused into the liquid so as to enable cell propagation.

4,649,115

MONOCLONAL ANTIBODIES TO SKIN CELLS

Bijan Safai; Edward A. Boyse, both of New York, N.Y., and Fung-Win Shen, Parsippany, N.J., assignors to Sloan-Kettering Institute, New York, N.Y.

Filed Mar. 31, 1983, Ser. No. 480,717
Int. Cl.[4] G01N 33/54; C12N 5/00, 15/00; C12R 1/91
U.S. Cl. 435—240 4 Claims

1. Hybridoma cell lines producing monoclonal antibody immunologically binding to and subsetting normal guinea pig keratinocyte cell antigen from the four different epidermal cell layers wherein the monoclonal antibodies are selected from the group consisting of Gpsk-1 (HB 8218), Gpsk-2, (HB 8281), Gpsk-3 (HB 8282), Gpsk-4 (HB 8283) and Gpsk-5 (HB 8284) and wherein

(1) Gpsk-1 and Gpsk-5 bind epidermal basement membrane keratinocyte antigen,

(2) Gpsk 2 binds epidermal basal and suprabasal layer keratinocyte antigen,

(3) Gpsk 3 and Gpsk 4 bind epidermal spinous and overlaying layer keratinocyte antigen, and

(4) Gpsk 5 binds epidermal spinous, granular and horny cell layer keratinocyte antigen.

4,649,116

MAGNETIC MEANS FOR WITHDRAWING MAGNETIC GEL BEADS FROM AN ASSAY FLUID

Jean Daty, La Chapelle en Serval, and André Assimon, Argenteuil, both of France, assignors to Institut Pasteur, Paris, France

Filed Oct. 29, 1984, Ser. No. 666,263
Claims priority, application France, Oct. 27, 1983, 83 17166
Int. Cl.[4] C12M 1/00
U.S. Cl. 435—287 2 Claims

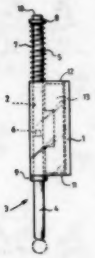
1. A magnetic device for withdrawing magnetic gel beads or

the like from a biological fluid and transferring the same into an immunoenzymatic assay medium, comprising in combination:

a housing of non-magnetic material which is constructed in the form of an insulating handle of said device and in which is formed a traversing orifice over its entire height, said traversing orifice being eccentric with respect to the vertical axis of the housing,

a magnetic eccentrically housed in said housing with respect to the vertical axis of this latter,

a rod housed in said eccentric traversing orifice, said orifice constituting a guide track for said rod, wherein said rod comprises an upper portion of non-magnetic material and a lower portion of magnetizable material, the latter having two limiting positions, namely a retracted position, in



which the magnetizable portion is under the magnetic influence of said magnet so as to exert a magnetic force, and a projected position, in which the magnetizable portion is beyond the magnetic influence of the magnet, and detachable fixing means for fastening said lower magnetizable portion of the rod to said upper non-magnetic portion of said rod such that said lower magnetizable portion is detachable from said upper non-magnetic portion of said rod,

manually operable means for bringing said lower magnetizable portion of said rod into said projected position, and

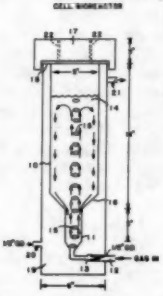
spring means for maintaining said lower magnetizable portion of said rod in said retracted position and to move said rod back into said retracted position after releasing said manually operable means.

4,649,117

AIR LIFT BIOREACTOR

Philip C. Familletti, Millington, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 15, 1985, Ser. No. 711,932
Int. Cl.⁴ C12M 1/04
U.S. Cl. 435—313 **12 Claims**



1. A bioreactor/fermentor which maintains cells or immobilized cells in suspension and whose geometry provides a mixing action to said cells with gentle aeration with a minimum of shear force, said bioreactor/fermentor comprising, a reactor vessel having a mixing chamber with a lower end and an open upper end, and a growth chamber with an open lower end located above said mixing chamber, wherein the open upper end of said mixing chamber and the open lower end of said growth chamber coincide with one another;

said mixing chamber having a first cylindrical side wall which defines the open upper end, a centrally located gas inlet means located in the lower end of said mixing chamber, and a bottom attached to the first cylindrical side wall of sealing the bottom of the reactor vessel, for receiving the gas inlet means and, together with the first cylindrical side wall, for defining the lower end of said mixing chamber; and

said growth chamber comprising a conical side wall defining the open lower end of said growth chamber, the conical side wall sloping inwardly toward the open upper end of said mixing chamber, a second cylindrical side wall of larger diameter than the first cylindrical side wall of said mixing chamber, the second cylindrical side wall being located above the conical side wall, and top lid means for providing an air tight seal on said growth chamber, the top lid means including gas vent means,

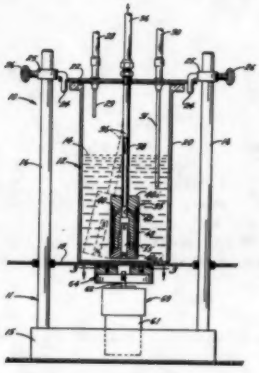
whereby oxygen containing gas may be introduced into said reactor vessel through the centrally located gas inlet means and bubbled up through the cells and liquid medium to gently carry the cells and liquid medium upward from said mixing chamber to said growth chamber and the cells and liquid medium in said growth chamber flow downward along the conical side wall sloping inwardly towards the open upper end of said mixing chamber to replace the cells and liquid medium being carried upwards from said mixing chamber by the oxygen containing gas, thereby providing a mixing action to said cells with aeration and a minimum of shear force while providing dissolved oxygen in the medium to support cell growth.

4,649,118

CELL CULTURING APPARATUS WITH IMPROVED STIRRING AND FILTER MEANS

John A. Anderson, Walden, N.Y., assignor to The VirTis Company, Inc., Gardiner, N.Y.

Filed Apr. 5, 1984, Ser. No. 597,161
Int. Cl.⁴ C12M 1/02
U.S. Cl. 435—316 **22 Claims**



1. An apparatus for culturing cells in a liquid medium comprising

a fluid tight culture vessel for containing a quantity of said medium and cells,

a filter head disposed within said vessel and having a filter media with openings smaller than the cells to be cultured,

flexible conduit means having one end fixed in fluid communication with said filter head for permitting liquid medium in said vessel to be drawn through said filter head and directed out of said vessel by passage through said flexible conduit means,

means fixedly supporting a portion of said flexible conduit means to said vessel,

magnetic means carried by said filter head, and

magnetic drive means located outside said vessel for moving a magnetic field in close relation to said filter head magnetic means for moving said filter head and the end of said flexible conduit means fixed thereto in said vessel for stirring the liquid medium and cells therein without relative movement between said vessel and the fixed portion of said flexible conduit means.

4,649,119

CLONING SYSTEMS FOR CORYNEBACTERIUM

Anthony J. Sinskey, Boston; Graham C. Walker, Arlington, both of Mass.; Kanji Higashio, Saitama, Japan; Eswara A. Rao, Beverly; William G. Shansbruch, Somerville, both of Mass., and Makoto Yoshihama, Saitama, Japan, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 28, 1983, Ser. No. 489,298

Int. Cl.[4] C12N *1/00, 15/00;* **C12P** *21/00*

U.S. Cl. 435—317 **7 Claims**

1. An essentially pure plasmid pSR1, derived from a coryneform microorganism, in an isolated form suitable for use as a cloning vector for expressing foreign and native genes in coryneform microorganisms, the plasmid having a molecular weight of about 2 megadaltons and having the following cleavage sites for restriction endonucleases:

Enzyme	# of Cleavage Sites
EcoR I	0
Hind II	2
Bgl II	1
Bamh I	1
Xba I	0
Bcl I	1.

4,649,120

PROCESS FOR REDUCING TURBIDITY IN CONTROL SERA

Dagmar Steuer, and Rudolf Schmidtberger, both of Marburg, Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 17, 1984, Ser. No. 641,589

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1983, 3329952

Int. Cl.[4] G01N *31/00*

U.S. Cl. 436—13 **3 Claims**

1. A process for reducing turbidity in a dried and reconstituted control serum, which comprises adding proline and Na deoxycholate to the control serum before drying wherein the concentration of the proline in the liquid control serum is 5–100 g/liter and the concentration of Na deoxycholate in the liquid control serum is 0.5–5 g/liter.

4,649,121

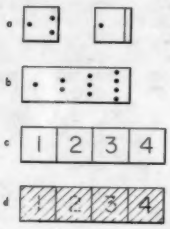
VIABILITY TEST DEVICE

Ibrahim A. Ismail, Mishawaka; Paul Hemmes; Mark T. Skarstedt, both of Elkhart, and Adam Zipp, Goshen, all of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Feb. 26, 1985, Ser. No. 705,711

Int. Cl.[4] G01N *35/00*

U.S. Cl. 436—14 **11 Claims**



1. A solid state unitary test device useful for determining the viability of a test composition incorporated therein, comprising:

(a) a carrier matrix;

(b) a test composition for the determination of an analyte, incorporated substantially uniformly with the carrier matrix, which test composition is capable of providing a detectable optical response upon wetting of the test composition incorporated carrier matrix with water in the presence of the analyte to be determined; and

(c) unreacted analyte, or analog thereof, incorporated in at least a portion of the test composition incorporated carrier matrix, at a concentration sufficient to provide a detectable optical response in the doubly incorporated carrier matrix upon wetting of the matrix with water.

4,649,122

MEANS FOR DETERMINING PERCENTAGE OF GLYCOHEMOGLOBIN IN WHOLE BLOOD

Jin P. Lee, Troy, Mich., assignor to Leeco Diagnostics, Inc., Southfield, Mich.

Continuation-in-part of Ser. No. 183,545, Sep. 2, 1980, abandoned. This application Mar. 26, 1981, Ser. No. 247,658

Int. Cl.[4] G01N *33/72*

U.S. Cl. 436—67 **22 Claims**

1. A method for determining the percentage of glycohemoglobin in patient whole blood, which comprises:

simultaneously subjecting total hemoglobin comprising non-carbohydrate fixed hemoglobin and glycohemoglobin of each sample of a batch at a common temperature of aliquot samples of

(1) a plurality of whole blood lysates P and

(2) whole blood lysates K_1 and K_2 of known glycohemoglobin percentages $\%_1$ and $\%_2$ to adsorption on an adsorbent which is specific either for the hemoglobin or for the glycohemoglobin in mixing slurry form in buffer solution, each sample being contained in its own sealed container of uniform size and shape and the batch of thus contained samples being synchronously mixed together by common agitation as a batch thereby adsorbing each sample under the same temperature conditions and leaving in solution the corresponding non-adsorbed total hemoglobin fractions P_f, K_{1f} and K_{2f},

measuring the ratios R_p, R_{k1} and R_{k2} of the optical density of aliquot samples of the fractions P_f, K_{1f} and K_{2f} to the respective optical denisty of aliquot samples of total hemoglobin lysates P, K_1 and K_2,

and expressing the percentage of glycohemoglobin relative to total hemoglobin for each patient blood sample by the relationship equivalent to

$$\frac{R_p(\%_2 - \%_1)}{R_{k2} - R_{k1}} + \%_2 - \frac{R_{k2}(\%_2 - \%_1)}{R_{k2} - R_{k1}}$$

4,649,123

ION TEST MEANS HAVING A HYDROPHILIC CARRIER MATRIX

Steven C. Charlton; Paul Hemmes, both of Elkhart, and Arthur L. Y. Lau, Mishawaka, all of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 493,982, May 12, 1983, abandoned. This application Jul. 2, 1985, Ser. No. 751,257
Int. Cl.[4] G01N *21/78, 33/52*
U.S. Cl. 436—79 33 Claims

1. A test means for determining the presence of an ion in an aqueous test sample, the test means comprising a hydrophilic carrier matrix incorporated with finely divided globules of a hydrophobic vehicle, said vehicle containing

an ionophore capable of forming a complex with a specific ion to be determined, and

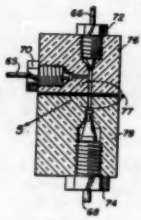
a reporter substance capable of interacting with the complex of the ionophore and the ion to produce a detectable response.

4,649,124

ELECTROLYTIC CONDUCTIVITY DETECTION PROCESS

Randall C. Hall, College Station, Tex., assignor to O. I. Corporation, College Station, Tex.

Division of Ser. No. 585,491, Mar. 2, 1984, Pat. No. 4,555,383. This application Sep. 9, 1985, Ser. No. 774,000
Int. Cl.[4] G01N *30/64*
U.S. Cl. 436—150 6 Claims



1. A process for determining a conductivity characteristic of a selected material from chromatographic methods, including the steps of:

generating a chromatographic gas flow containing a plurality of reaction products,

generating a flow of solvent effective to remove a selected reaction product from said gas flow,

mixing said gas flow and said solvent flow to form a mixed gas-liquid phase flow,

passing said mixed gas-liquid phase flow axially and sequentially through first and second boreholes axially spaced in first and second electrode plates to generate an electrical output signal, and

detecting said output signal across said first and second electrode plates, said output signal being functionally related to said selected reaction product solvent.

4,649,125

CERAMIC COMPOSITION FOR DIELECTRICS

Yukihisa Takeuchi, Nagoya, and Hideo Masumori, Anjyo, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Sep. 12, 1984, Ser. No. 649,672
Claims priority, application Japan, Apr. 13, 1984, 59-75396
Int. Cl.[4] C03C *8/24*
U.S. Cl. 501—15 18 Claims

9. A ceramic composition for an electronic circuit board, a hybrid integrated circuit, an integrated circuit package or a multilayer ceramic structure, consisting essentially of:

at least one insulating glass;

at least one material selected from the group consisting of refractory fillers and oxide additives wherein a ratio of weight percent of insulating glass to said material is 90/10–5/95;

at least one organic binder in an amount by weight of 0.5–30%; and

at least one oxidizing agent consisting essentially of at least one inorganic peroxide selected from the group consisting of calcium peroxide and strontium peroxide in an amount by weight of 0.1–40%, wherein oxygen from said at least one inorganic peroxide decomposes and removes said at least one organic binder in the ceramic composition during sintering of the composition, and enhances the sinterability of the ceramic composition.

4,649,126

GLASS WITH ANIONIC CONDUCTIVITY FOR FLUORINE

Khanzerifa I. Gaprindashvili; Vadim E. Kogan, both of Tbilisi; Dzhemal I. Kekelia, Mtskheta; Alexei A. Pronkin, Leningrad; Nana A. Salukvadze; Georgy V. Bakursdze, both of Tbilisi, all of U.S.S.R., and Konstantin K. Evstropiev, deceased, late of Leningrad, U.S.S.R. (by Galina I. Evstropieva, Sergei K. Evstropiev, administrators), assignors to Institut Kibernetiki Akademii Nauk Gruzinskoi SSR, Tbilisi, U.S.S.R.

PCT No. PCT/SU83/00040, § 371 Date Jun. 7, 1985, § 102(e) Date Jun. 7, 1985, PCT Pub. No. WO85/01934, PCT Pub. Date May 9, 1985
PCT Filed Oct. 31, 1983, Ser. No. 761,586
Int. Cl.[4] C03C *3/23*
U.S. Cl. 501—43 1 Claim

1. Glass having anionic conductivity for fluorine, consisting essentially of in percent by weight;

PbO, 86.0 to 87.0;

F, 3.5 to 0.5; and

B_2O_3, 10.5 to 12.5

which glass has a difference in the value of thermal expansion of not more than $5\times10^{-7*}$ C.$^{-1}$ upon variation of volume resistivity by two orders of magnitude.

4,649,127

PROCESS FOR HYDROGENATIVE REACTIVATION OF SPENT CATALYSTS

Thomas F. Degnan, Jr., Yardley, Pa., and Nai Y. Chen, Titusville, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 9, 1985, Ser. No. 690,065
Int. Cl.[4] B01J *29/38, 38/06, 38/10, 38/52*
U.S. Cl. 502—33 12 Claims

1. A process for reactivating a catalyst composition, comprising a zeolite and a binder material, and for removing ammonia and ammonia precursors from said zeolite, wherein said reactivating is subsequent to use of said catalyst composition in hydroprocessing a hydrocarbon feedstock including nitrogen containing components under hydroprocessing conditions including a temperature ranging from about 450° to about 850° F., a pressure ranging from about 400 to 5000 psig, an LHSV of 0.2 to 10 and H_2/feedstock of 100 to 10000 SCF/B, wherein said process for reactivating comprises

passing hydrogen over the catalyst composition at tempera-

tures ranging from about 850° F. to about 950° F. and pressures ranging from about 200 to about 1000 psig, and then

contacting the hydrogen contacted catalyst composition with a polar solvent

wherein said polar solvent has a molecular weight of less than about 200 and is a liquid at ambient conditions and is at least one compound selected from the group consisting of alcohols, aldehydes, ethers, and ketones at temperatures ranging from above ambient and up to about 500° C.,

at pressures ranging from about atmospheric up to about 1000 psig for a time sufficient to at least begin desorption of nitrogen, remaining after said hydrogen contact.

4. The process of claim 1, wherein the polar solvent is in the gaseous state.

7. A process for reactivating a catalyst composition, comprising a zeolite and a binder material, and for removing ammonia and ammonia precursors from said zeolite, wherein said reactivating is subsequent to use of said catalyst composition in hydroprocessing a hydrocarbon feedstock including nitrogen containing components under hydroprocessing conditions including a temperature ranging from about 450° to about 850° F., a pressure ranging from about 400 to 5000 psig, an LHSV of 0.2 to 10 and H_2/feedstock of 100 to 10000 SCF/B, wherein said process for reactivating comprises

passing hydrogen over the catalyst composition at temperatures ranging from about 850° F. to about 950° F. and pressures ranging from about 200 to about 1000 psig, and then

contacting the hydrogen contacted catalyst composition with a polar solvent for a time sufficient to at least begin desorption of nitrogen, remaining after said hydrogen contact, under conditions of temperature and pressure, under which conditions ammonia and ammonia precursors chemically bound to said zeolite desorb from said zeolite,

wherein said polar solvent has a molecular weight of less than about 200 and is a liquid at ambient conditions and is at least one compound selected from the group consisting of alcohols, aldehydes, ethers, and ketones,

wherein the temperatures of said polar solvent contacting range from above ambient and up to about 500° C.,

wherein pressures of said polar solvent contacting range from about atmospheric up to about 1000 psig.

4,649,128

DEACTIVATOR FOR OLEFIN POLYMERIZATION CATALYST

Louis J. Rekers, Wyoming, Ohio; Anthony N. Speca, Kingwood, Tex., and Harry W. Mayhew, Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Nov. 21, 1985, Ser. No. 800,233

Int. Cl.[4] C08F *4/64, 4/68, 4/62*

U.S. Cl. 502—109 **12 Claims**

1. A method comprising deactivating an olefin polymerization catalyst selected from the group consisting of Ziegler-Natta transition element catalysts and catalysts based on transition metal oxides by contacting said cataylst with a copolymer consisting of an alpha-olefin having from 2 to about 12 carbon atoms and an unsaturated ester of a carboxylic acid, said deactivating copolymer present in an amount such that the molar ratio of the unsaturated ester thereof to the sum of the transistion element component of the polymerization catalyst and a cocatalyst for said transistion element catalyst is in the range of between about 0.1 and about 6.

4,649,129

HYGROSCOPIC COMPOSITION FOR FIRE RESISTANT EXPANSION JOINT COVER

Charles L. Dunsworth, Midwest City, Okla., assignor to Metalines, Inc., Oklahoma City, Okla.

Division of Ser. No. 465,195, Feb. 9, 1983, Pat. No. 4,517,779. This application Jul. 30, 1984, Ser. No. 619,777

Int. Cl.[4] B01J *20/10*

U.S. Cl. 502—407 **6 Claims**

1. A composition of matter for disposition in combination with a fire barrier void to release vapor when heated, comprising:

a fire barrier void having a sealable entry; and

a mixture of silica gel with binder saturated with a non-flammable liquid adsorbed therein for generally sealed disposition in said fire barrier void.

2. A composition of matter as set forth in claim 1, wherein: said binder is a commercial grade gypsum plaster.

4. A composition of matter as set forth in claim 1 wherein: said non-flammable liquid is water.

4,649,130

NOVEL DERIVATIVES OF ARGININE VASOPRESSIN ANTAGONISTS

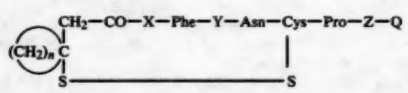
Maurice Manning, Toledo, Ohio, and Wilbur H. Sawyer, Scarsdale, N.Y., assignors to Medical College of Ohio, Toledo, Ohio and The Trustees of Columbia University, New York, N.Y., a part interest

Continuation-in-part of Ser. No. 574,257, Jan. 26, 1984. This application Jan. 23, 1985, Ser. No. 693,870

Int. Cl.[4] A61K *37/24*; C07K *7/16*

U.S. Cl. 514—11 **25 Claims**

1. A compound of the formula



wherein n is 4 or 5; X is (D- or L-)Tyr(R), D-Phe, D-Val, D-Leu, D-Ile, D-Nva, D-Nle, D-Cha, D-Abu, D-Thr, D-Asn, D-Gln or D-Met; Y is Val, Ile, Thr, Ala, Lys, Cha, Nva, Met, Nle, Orn, Ser, Asn, Gln, Phe, Tyr, Gly, Abu or Leu; Z is (D- or L-)Arg, Orn or Lys; Q is Orn(NH_2), $NHCH_2CH_2NH_2$, Val(NH_2), Phe(NH_2), Ile(NH_2), Thr(NH_2), Pro(NH_2) or Tyr(NH_2) and R is methyl, ethyl, propyl or butyl, provided that when Y is Val or Gln, R is also H.

4,649,131

GROWTH HORMONE RELEASING FACTOR ANALOGS

Arthur M. Felix, West Caldwell; Edgar P. Heimer, Sparta, and Thomas F. Mowles, Pine Brook, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

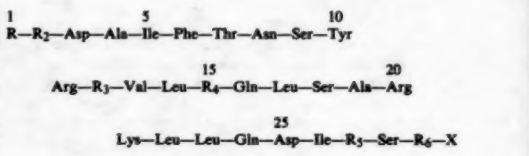
Continuation-in-part of Ser. No. 653,163, Sep. 24, 1984. This application Aug. 6, 1985, Ser. No. 762,891

The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.

Int. Cl.[4] A61K *37/36, 37/24*; C07K *7/10*

U.S. Cl. 514—12 **37 Claims**

1. A growth hormone releasing factor (GRF) compound of the formula



wherein R represents Tyr, D-Tyr, desNH_2-Tyr, Ac-Tyr or His; R_2 represents Ala N-Methyl-D-Ala or D-Ala; R_3 represents Lys or Ala; R_4 represents Ala, Leu, Val, Ile, Nle, Nval, β-Ala or α-Aib; R_5 represents Met, Leu, Nle or Ile; R_6 represents an amino acid sequence selected from Arg-Gly-Gln-Gly-Glu-Ser-Asn-Gln-Glu-Arg-Gly-Ala-Arg-Ala-Arg-Leu or fragments thereof where the fragment is reduced in number by one to fifteen amino acids from the carboxyl end; and, X is either OH or NH_2 and, the pharmaceutically acceptable acid or base addition salts thereof.

4,649,132

TREATMENT OF FACTOR VIII INHIBITORS

Theodore S. Zimmerman, and Carol A. Fulcher, both of La Jolla, Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Continuation-in-part of Ser. No. 481,105, Mar. 31, 1983, Ser. No. 556,508, Nov. 30, 1983, and Ser. No. 673,916, Nov. 21, 1984. This application May 24, 1985, Ser. No. 738,134

Int. Cl.[4] A61K *37/43;* **C07K** *7/10*

U.S. Cl. 514—12 **33 Claims**

1. A polypeptide which neutralizes the activity of Factor VIII inhibitor and whose amino acid sequence is that of a fragment of human Factor VIII selected from the group consisting of:

(i) fragments whose amino-terminal residue is one of residues 360–380 and whose carboxyl-terminal residue is one of residues 394–465;

(ii) fragments whose amino-terminal residue is one of residues 395–466 and whose carboxyl-terminal residue is one of residues 472–492;

(iii) fragments whose amino-terminal residue is one of residues 360–380 and whose carboxyl-terminal residue is one of residues 472–492;

(iv) fragments whose amino-terminal residue is one of residues 1674–1694 and whose carboxyl-terminal residue is one of residues 1708–1775;

(v) fragments whose amino-terminal residue is one of residues 1709–1776 and whose carboxyl-terminal residue is one of residues 1782–1802; and

(vi) fragments whose amino-terminal residue is one of residues 1674–1694 and whose carboxyl-terminal residue is one of residues 1782–1802.

4,649,133

METHOD FOR THE TREATMENT OF PAINS OR PYREXIA DUE TO THE ACCENTUATION OF CENTRAL NERVE

Chikao Yoshikumi, Tokyo; Yoshio Ohmura, Funabashi; Fumio Hirose, Tokyo; Masanori Ikuzawa, Tokyo; Kenichi Matsunaga, Tokyo; Takayoshi Fujii, Tokyo; Minoru Ohhara, Tokyo, and Takao Ando, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 584,629, Feb. 21, 1984, Pat. No. 4,555,505, which is a continuation-in-part of Ser. No. 484,592, Apr. 13, 1983, Pat. No. 4,559,327, which is a continuation-in-part of Ser. No. 289,226, Aug. 3, 1981, abandoned, which is a division of Ser. No. 102,535, Dec. 11, 1979, Pat. No. 4,313,939, which is a continuation-in-part of Ser. No. 39,218, May 15, 1979, abandoned. This application Sep. 26, 1985, Ser. No. 780,211

Claims priority, application Japan, May 26, 1978, 53-63146; Dec. 29, 1978, 53-161385; Dec. 29, 1978, 53-161386

Int. Cl.[4] A61K *31/70*

U.S. Cl. 514—42 **8 Claims**

1. A method for the treatment of pains due to the accentuation of central nerve, which comprises administering to a patient suffering therefrom a pharmaceutically effective amount of p-aminobenzoate-N-L-rhamnoside or a pharmaceutically acceptable salt thereof.

4,649,134

PHARMACEUTICAL COMPOSITION CONTAINING DEFIBROTIDE FOR THE TREATMENT OF STATES OF ACUTE RENAL INSUFFICIENCY

Vittorio Bonomini, Bologna, Italy, assignor to Crinos Industria Farmacobiologica SpA, Villa Guardia Como, Italy

Filed Sep. 10, 1984, Ser. No. 649,069

Claims priority, application Italy, Sep. 12, 1983, 22856 A/83

Int. Cl.[4] A61K *31/70*

U.S. Cl. 514—44 **9 Claims**

1. A method of treating acute renal insufficiencies in a patient in need of such treatment, said method comprising administering to said patient an effective amount of defibrotide.

4,649,135

MYCOTRIENIN-RELATED COMPOUNDS

Noboru Otake, Yokohama; Haruo Seto, Hachioji; Tetsuo Sasaki, Kounosu; Masanori Sugita, Sakado, and Shigeru Hiramoto, Kawagoe, all of Japan, assignors to Nisshin Flour Milling Co., Ltd., Japan

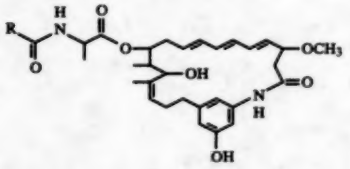
Filed Apr. 15, 1986, Ser. No. 852,441

Claims priority, application Japan, Apr. 22, 1985, 60-84615; Feb. 28, 1986, 61-41839

Int. Cl.[4] C07D *225/06;* **C12P** *17/10;* **A61K** *31/395*

U.S. Cl. 514—183 **12 Claims**

1. A mycotrienin-related compound of the formula



wherein R represents isobutyl, sec.-butyl, isopentyl or cyclohexyl.

7. A method of treating tumors is a patient which comprises administering to said patient an antitumor effective amount of a compound as defined in claim 1.

4,649,136

CEPHEM COMPOUNDS

Takao Takaya, Kawanishi; Hisashi Takasugi, Osaka, and Hideaki Yamanaka, Hirakata, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

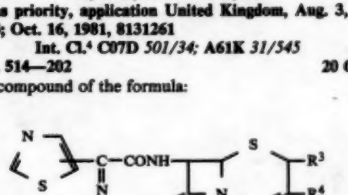
Division of Ser. No. 402,256, Jul. 27, 1982. This application Jan. 14, 1985, Ser. No. 690,985

Claims priority, application United Kingdom, Aug. 3, 1981, 8123683; Oct. 16, 1981, 8131261

Int. Cl.[4] C07D *501/34;* **A61K** *31/545*

U.S. Cl. 514—202 **20 Claims**

1. A compound of the formula:



wherein

R^1 is carboxy(lower)alkyl or protected carboxy(lower)alkyl

R^2 is carboxy or protected carboxy,

R^3 is hydrogen or lower alkyl, and

R^4 is lower alkyl, lower alkoxy, lower alkanoyl, lower alkoxycarbonyl, ar(lower)alkanoyl, ar(lower)alkoxycarbonyl, lower alkylthiomethyl, lower alkoxymethyl, halogen,

lower alkenyl or hydrogen, provided that R^3 is lower alkyl when R^4 is hydrogen,

and pharmaceutically acceptable salts thereof.

4,649,137

2-ACYLAMINOMETHYL-1,4-BENZODIAZEPINE COMPOUNDS, THE PREPARATION THEREOF, AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Horst Zeugner, Hanover, Fed. Rep. of Germany; Dietmar Romer, Allschwil, Switzerland; Hans Liepmann, Hanover, and Wolfgang Milkowski, Burgdorf, both of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

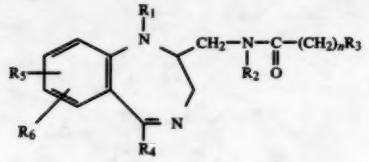
Continuation of Ser. No. 615,285, May 30, 1984, abandoned, which is a division of Ser. No. 386,303, Jun. 8, 1982, Pat. No. 4,497,740. This application Apr. 3, 1986, Ser. No. 847,112

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1981, 3124013

Int. Cl.[4] C07D *401/12, 403/12, 405/12, 409/12*

U.S. Cl. 514—221 **20 Claims**

1. A 2-acylaminomethyl-1H-2,3-dihydro-1,4-benzodiazepine compound corresponding to the general formula I



I

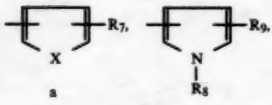
wherein

R_1 is hydrogen, or lower alkyl;

R_2 is hydrogen;

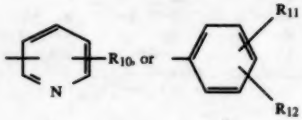
n is 0, 1 or 2;

R_3 is



a

b



c

d

wherein

X is oxygen or sulfur;

R_7 is hydrogen, halogen, or lower alkyl;

R_8 is hydrogen or lower alkyl;

R_9 is hydrogen or lower alkyl;

R_{10} is hydrogen, chlorine, or lower alkyl;

R_{11} is hydrogen, halogen, lower alkyl, lower alkoxy, hydroxyl, nitro, trifluoromethyl, cyano, amino, lower mono- or dialkylamino, lower mono-alkylnoylamino, or lower alkanoyloxy;

R_{12} is hydrogen, halogen, lower alkyl, lower alkoxy, hydroxyl or lower alkanoyloxy; or

R_{11} and R_{12} are bonded to adjacent carbon atoms and together denote methylenedioxy or ethylenedioxy;

R_4 is one of the radicals a, or b defined above;

R_5 is hydrogen, halogen, lower alkyl, lower alkoxy or nitro; and

R_6 is hydrogen, halogen, lowes alkyl or lower alkoxy; or

R_5 and R_6 are bonded to adjacent carbon atoms and together denote methylenedioxy or ethylenedioxy; and the optical isomers and acid addition salts of said compound.

4,649,138

PHARMACEUTICAL COMPOSITIONS

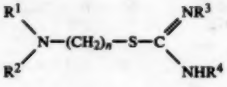
Graham J. Durant; Charon R. Ganellin, and Margaret R. Vickers, all of Welwyn Garden City, England, assignors to Smith-Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 458,610, Jan. 17, 1983, Pat. No. 4,490,387, which is a division of Ser. No. 269,248, Jun. 1, 1981, Pat. No. 4,378,365, which is a division of Ser. No. 82,836, Oct. 9, 1979, Pat. No. 4,294,854, which is a division of Ser. No. 853,773, Nov. 21, 1977, Pat. No. 4,205,071, which is a continuation-in-part of Ser. No. 795,983, May 11, 1977, abandoned. This application Sep. 28, 1984, Ser. No. 655,197

Int. Cl.[4] C07D *413/12, 295/08;* **A61K** *31/535*

U.S. Cl. 514—232 **7 Claims**

1. A pharmaceutical composition having immunosuppressant activity comprising a pharmaceutical carrier and, in an effective amount to produce immunosuppressant activity, an isothiourea derivative of the formula:



wherein n is 2, 3, or 4; R^1 and R^2 together with the nitrogen atom shown form a morpholine ring; and R^3 and R^4, which may be the same or different, are lower alkyl, or together may form a $—(CH_2)_x—$ group where x is 2, or a pharmaceutically acceptable acid addition salt thereof.

4,649,139

1,2,4-TRIAZINES

Geoffrey Allan, London; Alistair A. Miller, Tonbridge, and David A. Sawyer, Hayes, all of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

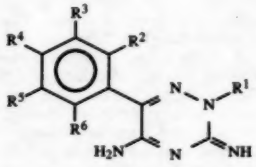
Filed Oct. 22, 1984, Ser. No. 663,682

Claims priority, application United Kingdom, Oct. 27, 1983, 8328757

Int. Cl.[4] C07D *253/06;* **A61K** *31/53*

U.S. Cl. 514—242 **20 Claims**

1. A compound of formula I:



(I)

or the 5-imino tautomer thereof or a salt of either, wherein R^1 is selected from C_{1-10} alkyl, C_{2-10} alkenyl, C_{2-10} alkynyl and C_{1-10} cycloalkyl, and R^2 to R^6 are independently selected from hydrogen, halogen, C_{1-6} alkyl, alkenyl, alkynyl or alkoxy (all optionally substituted by one or more of halogen, hydroxy and aryl), amino, amino mono- or di-substituted with lower alkyl alkenyloxy, lower alkanoyl, acyloxy, cyano, nitro, phenyl and alkylthio groups or any adjacent two of R^2 to R^6 are linked to form a (—CH=CH—CH=CH—) group, in the above the total number of carbon atoms in R^2 to R^6 is less than eight.

8. A pharmaceutical composition comprising a non-toxic

effective antiarrhythmic amount of a compound of claim 1 or a salt thereof and a pharmaceutically acceptable carrier.

4,649,140

PURINE DERIVATIVES

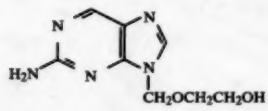
Howard J. Schaeffer, Raleigh, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 434,393, Oct. 14, 1982, abandoned. This application Jan. 28, 1985, Ser. No. 695,738

Int. Cl.[4] C00D *413/18;* A61K *31/52*

U.S. Cl. 514—261 **14 Claims**

1. A compound of formula (I)



(I)

or a physiologically acceptable salt thereof.

4,649,141

PYRIMIDINE COMPOUNDS

Thomas H. Brown, Welwyn Garden City, and Robert J. Ife, Stevenage, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

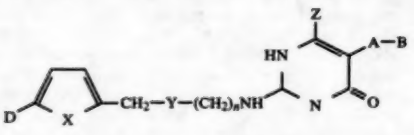
Division of Ser. No. 156,523, Jun. 4, 1980, Pat. No. 4,539,407, which is a division of Ser. No. 9,990, Feb. 7, 1979, Pat. No. 4,234,588. This application Jun. 21, 1985, Ser. No. 747,496

Claims priority, application United Kingdom, Feb. 13, 1978, 5740/78; May 25, 1978, 22834/78; Nov. 13, 1978, 44259/78

Int. Cl.[4] A61K *31/505;* C07D *405/06, 405/12*

U.S. Cl. 514—272 **17 Claims**

1. A compound of the formula:



in which D is hydrogen or $R^1R^2N(CH_2)_m$—, R^1 and R^2 are hydrogen, lower alkyl, phenyl(lower alkyl) or R^1 and R^2 taken together with the nitrogen atom shown can form a pyrrolidino or piperidino group, m is from 1 to 6, X is oxygen or sulphur, Y is sulphur, oxygen or methylene, n is 2 or 3, Z is hydrogen or lower alkyl, A is C_1–C_5 alkylene or —$(CH_2)_pW(CH_2)q$— where W is oxygen or sulphur and p and q are such that their sum is from 1 to 4, and B is a 6-(2,3-dihydro-1,4-benzodioxinyl) group, in the form of the free base or its pharmaceutically acceptable acid addition salts.

16. A method of blocking histamine H_2-receptors which comprises administering to an animal in need thereof in an effective amount to block said receptors a compound of claim 1.

4,649,142

3,4-DIHYDRO-1,3-DISUBSTITUTED-6-(SUBSTITUTED PHENYLIMINO)-2(1H)-PYRIMIDINONE USEFUL AS CARDIOTONIC AGENT AND ANTI-ALLERGIC AGENT

Takao Takaya, Kawanishi; Masayoshi Murata, Osaka, and Kiyotaka Ito, Ibaragi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

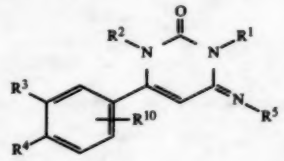
Filed Jun. 7, 1985, Ser. No. 743,525

Claims priority, application United Kingdom, Jun. 25, 1984, 8416140; Sep. 17, 1984, 8423438; Oct. 26, 1984, 8427122

Int. Cl.[4] A61K *31/505;* C07D *239/02*

U.S. Cl. 514—274 **6 Claims**

1. Pyrimidinone compounds of the formula:



wherein

R^1 and R^2 are each lower alkyl, lower alkoxycarbonyl (lower) alkyl, carboxy (lower) alkyl or di(lower) alkylamino (lower) alkyl,

R^3 is hydroxy, lower alkoxy, halo (lower) alkoxy, lower alkylthio, lower alkanesulfinyl, lower alkanesulfonyl, nitro, amino or di(lower) alkanesulfonylamino,

R^4 is hydroxy, lower alkoxy, halo (lower) alkoxy, lower alkoxycarbonyl (lower) alkoxy or carboxy(lower)alkoxy, or

R^3 and R^4 are taken together to form lower alkylendedioxy or lower alkylidenedioxy,

R^5 is phenyl substituted with 1 to 4 substituents selected from the group consisting of lower alkyl and sulfamyl,

R^{10} is hydrogen or sulfamyl, provided that when both of R^1 and R^2 are lower alkyl and R^3 and R^4 are lower alkoxy, then R^{10} is sulfamoyl, and that when R^3 is hydroxy, then R^4 is hydroxy, and pharmaceutically acceptable salts thereof.

6. A method of treating heart disease which comprises administering to a subject in need of such treatment a cardiotonically effective amount of the compound of claim 1.

4,649,143

METHODS AND COMPOSITIONS FOR TREATING PROTOZOAL INFECTIONS WITH A NOVEL ANTIBIOTIC

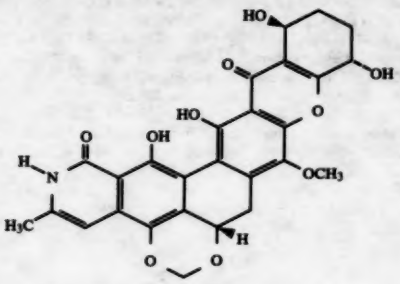
Sidney Kantor, Cranbury, and Robert L. Kennett, Jr., Lambertville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 26, 1984, Ser. No. 593,152

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—279 **8 Claims**

1. A method for the control of protozoan infections in warm-blooded animals, said method comprising: administering to the animals a protozoacidally-effective amount of a compound of the formula,



LL-D42067β

or a pharmaceutically and pharmacologically acceptable salt thereof.

4,649,144

ANTIBACTERIAL 7-(3-AMINO-1-PYRROLIDINYL)-1-CYCLOPROPYL-6-FLUORO-1,4-DIHYDRO-4-OXO-1,8-NAPHTHYRIDINE-3-CARBOXYLIC ACID DERIVATIVES

Jun-ichi Matsumoto, Ikoma; Teruyuki Miyamoto, Sakai; Hitoshi Uno, and Shinichi Nakamura, both of Takatsuki, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

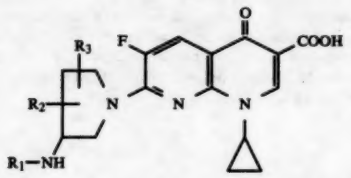
Filed Jul. 20, 1984, Ser. No. 632,853

Claims priority, application Japan, Jul. 27, 1983, 58-138000; Jun. 6, 1984, 59-117266

Int. Cl.⁴ A61K *31/435*; C07D *471/04*

U.S. Cl. 514—300 **15 Claims**

1. A 1,8-naphthyridine derivative of the formula



wherein R_1, R_2 and R_3 are the same or different and each is hydrogen or lower alkyl having 1 to 5 carbon atoms; or a pharmaceutically acceptable ester, or a pharmaceutically acceptable salt thereof.

15. A method for treatment of a bacterial infectious disease which comprises administering to a warm-blooded animal an antibacterially effective amount of a compound or ester or salt thereof as defined in claim 1.

4,649,145

THIAZOLE DERIVATIVES

Barry C. Ross, Luton, and Jeffrey D. Michael, Milton Keynes, both of Great Britain, assignors to Hoechst UK Limited, Great Britain

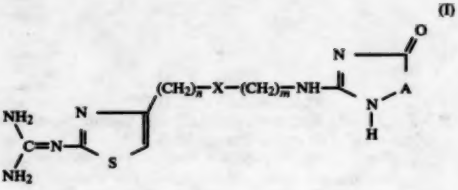
Continuation of Ser. No. 524,242, Aug. 18, 1983, abandoned. This application Dec. 2, 1985, Ser. No. 803,523

Claims priority, application United Kingdom, Aug. 20, 1982, 8224024

Int. Cl.⁴ C07D *417/12*; A61K *31/425*

U.S. Cl. 514—370 **7 Claims**

1. A compound of the formula I



(I)

in which

X represents —O—, —CH_2—, —S—, or —NH—,

n represents 1 or 2,

m represents 2, 3 or 4, and

A represents

in which

R^3 and R^4, which may be the same or different, each represents

a hydrogen atom;

a straight or branched chain alkyl group having from 1 to 10 carbon atoms or

an alkenyl group having from 2 to 10 carbon atoms, wherein said alkyl or alkenyl group is unsubstituted or substituted by one or more groups, which may be the same or different, selected from the group consisting of hydroxyl groups; —OR^6 groups in which R^6 represents a lower alkyl group or a phenyl group; —NR^7R^8 groups in which R^7 and R^8 each denotes a hydrogen atom, a lower alkyl group, a phenyl group, or a lower acyl group; —$COOR^9$ groups, in which R^9 represents a hydrogen atom or a lower alkyl group; —$CONR^7R^8$ in which R^7 and R^8 are as defined above and in addition together with the N atom may form a 5 or 6 membered ring; phenyl groups which are unsubstituted or substituted by a lower alkyl, lower alkoxy, phenoxy, halogen, dimethylaminomethyl, trifluoromethyl, nitro, cyano, sulphonic acid or sulphonamide substituent; heterocyclic groups selected from the group consisting of pyridine, thiophen and furan groups, which are unsubstituted or substituted as defined above for said phenyl groups, lower alkylsulphonyl and phenylsulphonyl groups, and nitrile groups;

a phenyl group or a phenyl group bearing one or more substituents selected from the group consisting of (C_1–C_4) lower alkyl, (C_1–C_4) lower alkoxy, phenoxy, chlorine, bromine, iodine, fluorine, dimethylaminomethyl, trifluoromethyl, nitro, cyano, sulphonic acid and sulphonamide substituents; or

a five or six membered heterocycle selected from the group consisting of pyridine, thiophen, furan and tetrahydrofuran; or

R^3 and R^4 together with the carbon atom to which they are bonded form a cyclohexyl or cyclopentyl ring;

or a physiologically tolerable salt thereof.

4,649,146
THIAZOLE DERIVATIVES AND PHARMACEUTICAL COMPOSITION COMPRISING THE SAME

Takao Takaya, Kawanishi, and Hisashi Takasugi, Osaka, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jan. 27, 1984, Ser. No. 574,517
Claims priority, application United Kingdom, Jan. 31, 1983, 8302591; Sep. 26, 1983, 8325684
Int. Cl.[4] A61K *31/47*; C07D *417/04*
U.S. Cl. 514—307 9 Claims

1. A compound of the formula:

wherein

R^1 is lower alkyl, carboxy, hydroxymethyl, halomethyl, lower alkylthiomethyl or hydroxyiminomethyl,

R^2 is hydrogen, hydroxy, lower alkyl, pyridyl, amino, lower alkylamino, pyridylamino or guanidino optionally substituted with dimethylaminomethylene,

R^3 is dihydroisoquinolyl which may be substituted with halogen, lower alkyl, lower alkoxy, carboxy, hydroxy, pyridyl, amino, lower alkylamino, pyridylamino or guanidino,

Q is —CO—, and

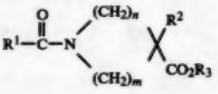
n is an integer of 0 or 1, and pharmaceutically acceptable salts thereof.

4,649,147
TREATING ELASTIN DEGRADATION WITH 1-(ALKENOYL)AZACYCLOALKYL CARBOXYLIC ACIDS AND DERIVATIVES

Richard A. Mueller, Glencoe, and Richard A. Partis, Evanston, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Jul. 8, 1985, Ser. No. 752,873
Int. Cl.[4] A61K *31/445*; C07D *211/64*
U.S. Cl. 514—315 15 Claims

1. A compound of the formula:



wherein R^1 is:

(a) alkenyl of 14 to 22 carbon atoms, inclusive;

(b) alkadienyl of 14 to 22 carbon atoms, inclusive; or

(c) alkapolyenyl of 14 to 22 carbon atoms, inclusive;

wherein R^2 is:

(a) hydrogen; or

(b) phenyl;

wherein R^3 is:

(a) hydrogen;

(b) alkyl of 1 to 6 carbon atoms, inclusive;

(c) alkali metal;

(d) alkaline earth metal; or

(e) $NR^4R^5R^6R^7+$;

wherein R^4, R^5, R^6, and R^7, each being the same or different, are:

(a) hydrogen;

(b) alkyl or 1 to 6 carbon atoms, inclusive; or

(c) hydroxyalkyl of 2 to 4 carbon atoms, inclusive;

wherein m is 0, 1, or 2; and

wherein n is an integer from 1 to 5, inclusive, with the proviso that the sum (m+n) is 2 to 5, inclusive.

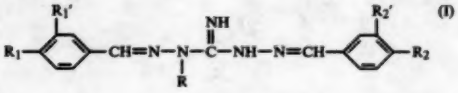
13. A method for treating protease-induced degradation of elastin and other proteins in mammals comprising administering a therapeutically effective amount of at least one compound of claim 1 to a mammal in need of such treatment.

4,649,148
INSECTICIDAL USES OF DIAMINOGUANIDINE HYDRAZONE COMPOUNDS

Roger W. Addor; Donald P. Wright, Jr., both of Pennington; Jack K. Siddens, Princeton Junction, and John J. Haud, Lawrenceville, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 704,974, Feb. 25, 1985, Pat. No. 4,575,560. This application Oct. 17, 1985, Ser. No. 788,296
Int. Cl.[4] A01N *43/40, 47/12, 47/34, 47/40*
U.S. Cl. 514—321 7 Claims

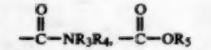
1. A method for controlling lepidopterous insects and protecting crops, trees, shrubs, and ornamentals by reducing the feeding of the insects comprising applying to the plant an insecticidally-effective amount, or an amount sufficient to inhibit feeding of a compound having the structure



(I)

wherein R_1' and R_2' are H, and R_1 and R_2 are individually selected from fluoro, chloro, bromo, trifluoromethyl, CF_3CH_2O, CHF_2X, CF_3X, CHY_2CF_2X, or $CHFYCF_2X$, where X is O or S and Y is F or Cl; or wherein R_1 and R_1' or R_2 and R_2' are $—OCF_2O—$, $—OC(CH_3)_2—O—$, $—OCF_2CHFO—$ or $—OCF_2CF_2O—$;

R is H,



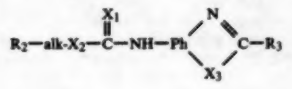
where R_3 is C_1–C_2 alkyl, or C_1–C_2 haloalkyl, R_4 is hydrogen or C_1–C_2 alkyl; or R_3 and R_4 when taken together may form a ring represented by $CH_2(CH_2)_n—$ where n is 3 or 4; R_5 is C_1–C_4 alkyl optionally substituted with one to three halogens or C_3–C_4 alkenyl.

4,649,149
PROCESS FOR THE MANUFACTURE OF NOVEL BENZAZOLE DERIVATIVES, PHARMACEUTICAL PREPARATIONS CONTAINING THESE DERIVATIVES, AND THEIR USE

Jean-Jacques Gallay, Magden, and Ernst Schweizer, Arlesheim, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 418,955, Sep. 16, 1982, Pat. No. 4,511,567, which is a continuation-in-part of Ser. No. 262,259, May 11, 1981, abandoned. This application Jan. 17, 1985, Ser. No. 692,255
Int. Cl.[4] C07D *277/64, 263/56, 235/08*; A61K *31/425*
U.S. Cl. 514—367 24 Claims

1. A compound selected from the group consisting of a benzazole of the formula



in which

R_2 is carboxy, lower alkoxycarbonyl, or hydroxymethyl;

alk is lower alkylene;

each of X_1 and X_2, independently of the other is oxygen or sulfur;

Ph is 1,2-phenylene, or 1,2-phenylene which is mono- or disubstituted with lower alkyl, lower alkoxy, lower alkanoyl, trifluoromethyl, or halo;

X_3 is oxygen, sulfur, imino, or imino substituted with lower alkyl, di(lower alkyl)amino lower alkyl, phenyl or phenylalkyl; and

R_3 is lower alkyl, fluoro lower alkyl, or cycloalkyl of 3 to 8 carbon atoms; and

the pharmaceutically acceptable salts thereof.

4,649,150

ANTIULCEROGENIC AMIDINE DERIVATIVES OF 2-SUBSTITUTED 4-PHENYLIMIDAZOLE

Giuseppe Bietti, Milan; Enzo Cereda, Tortona; Arturo Donetti; Antonio Giachetti, both of Milan, and Ferdinando Pagani, Verano Brianza, all of Italy, assignors to Istituto de Angeli, S.p.A., Milan, Italy

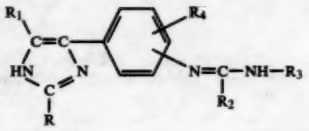
Filed May 16 1984, Ser. No. 610,958

Claims priority, application Italy, Jul. 18, 1983, 22110 A/83

Int. Cl.[4] A61K *31/415, 31/44;* **C07D** *233/64, 233/70*

U.S. Cl. 514—392 **10 Claims**

1. A compound of the formula



wherein

R is straight or branched lower alkyl, hydroxyl, alkoxy of 1 to 3 carbon atoms, mercapto, (alkyl of 1 to 3 carbon atoms)thio, halogen, (alkyl of 1 to 3 carbon atoms)sulfinyl, (alkyl of 1 to 3 carbon atoms)sulfonyl, sulfamoyl, amino, (alkyl of 1 to 3 carbon atoms)amino, di(alkyl of 1 to 3 carbon atoms)amino, lower alkanoylamino or phenyl;

R_1 and R_2 are each independently hydrogen or lower alkyl;

R_3 is straight or branched lower alkyl, hydroxy(alkyl of 1 to 6 carbon atoms), (alkoxy of 1 to 6 carbon atoms)-(alkyl of 1 to 6 carbon atoms), (alkyl of 1 to 6 carbon atoms)thio(alkyl of 1 to 6 carbons atoms), cyano(alkyl of 1 to 6 carbon atoms), lower alkenyl, lower alkynyl, cyano, phenyl, chlorophenyl, benzyl, cyclo lower alkyl, cyclo lower alkyl(alkyl of 1 to 2 carbon atoms) or an aromatic 5- to 6-membered heterocyclic ring containing one heteroatom; and

R_4 is hydrogen, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, halogen, cyano or carbamoyl;

a tautomer thereof, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

9. The method of treating gastrointestinal ulcers in a warm-blooded animal in need thereof, which comprises perorally or parenterally administering to said animal an effective antiulcerogenic amount of a compound of claim 1.

4,649,151

DRUGS COMPRISING PORPHYRINS

Thomas J. Dougherty; William R. Potter, both of Grand Island, and Kenneth R. Weishaupt, Sloan, all of N.Y., assignors to Health Research, Inc., Buffalo, N.Y.

Continuation-in-part of Ser. No. 481,345, Apr. 1, 1983, abandoned, which is a continuation-in-part of Ser. No. 424,647, Sep. 27, 1982, abandoned. This application May 14, 1984, Ser. No. 609,991

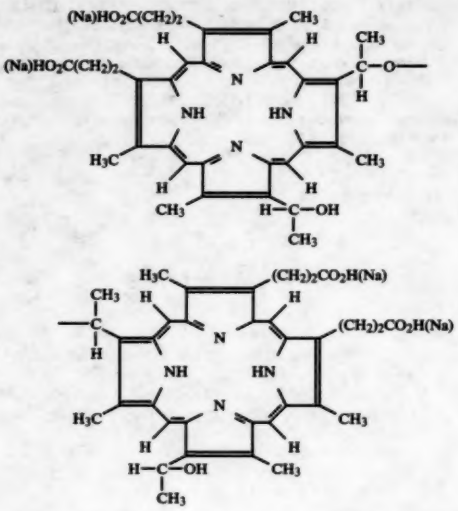
Int. Cl.[4] A61K *31/40;* **C07D** *437/22*

U.S. Cl. 514—410 **8 Claims**

1. A drug comprising:

a mixture of porphyrins;

at least some of the molecules of said porphyrin mixture having the molecular formula:



said molecules with said formulae being fluorescent, photosensitizing, having the capability of localizing in and being retained in tumor tissue as compared to normal tissues, forming a high molecular weight aggregate with adsorption peaks in the visible spectrum in water at approximately 365, 505, 537, 575 and 615 nanometers, adsorption peaks in the infrared spectrum at approximately 3.0, 3.4, 6.4, 7.1, 8.1, 9.4, 12 and 15 microns, adsorption peaks in carbon-13 nuclear magnetic resonance study at approximately 9.0, 18.9, 24.7, 34.5, 62, 94.5, 130–145, 171.7 ppm and possibly 118 and 127 relative to a 37.5 ppm resonance peak of dimethyl sulfoxide and additional adsorption peaks in carbon-13 nuclear magnetic study at approximately 27.9 ppm and 68.4 ppm relative to the resonance peak of tetramethylsilane in deuterated chloroform solvent; and

at least 50 percent of the porphyrins in said mixture being of said molecule having said molecular formula.

4,649,152

COMPOSITION AND METHOD FOR TREATMENT OF POTASSIUM DEFICIENCY

Emanuel Revici, New York, N.Y., assignor to Elena Avram, New York, N.Y.

Filed Oct. 1, 1985, Ser. No. 782,662

Int. Cl.[4] A61K *31/40*

U.S. Cl. 514—425 **20 Claims**

1. A method for making a composition which comprises:

selecting at least one fatty acid or fatty ester compound having an allylic unsaturation of the type —CH=CH—CH_2—CH=CH— or —CH=CH—CH=CH—CH_2—;

adding to said compound a potassium salt to form a mixture;

heating said mixture above about 230° C. for a sufficient period of time to incorporate at least about 0.1% by weight potassium into the compound;

cooling the mixture; and

recovering the potassium-incorporated compound as the remaining fluid of the mixture.

4,649,153

5,6-DIHYDRO-4H-CYCLOPENTA(B)THIOPHENE-6-CARBOXYLIC ACIDS, PREPARATION PROCESSES AND MEDICINES CONTAINING THEM

Gérard Ferrand, Lyon; Jacques Barbanton, Brignais, and Jean-Claude Depin, Lyon, all of France, assignors to Lipha, Lyonnaise Industrielle Pharmaceutique, Lyon, France

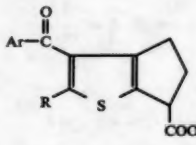
Filed Jun. 20, 1985, Ser. No. 746,785

Claims priority, application France, Jul. 9, 1984, 84 10861

Int. Cl.[4] A61K *31/38*; C07D *333/56*

U.S. Cl. 514—443 11 Claims

1. A 5,6-dihydro-4H-cyclopenta[b]thiophene-6-carboxylic acids of the formula



in which Ar is phenyl, optionally substituted by one or more halogen atoms or by a lower alkyl, lower alkoxy, hydroxy, nitro or dimethylamino group; thienyl optionally substituted by a halogen atom or a lower alkyl group; or furyl group R is methyl or ethyl; a pharmaceutically acceptable salt, or ester or amide thereof.

4,649,154

FUNGICIDAL AND/OR BACTERICIDAL COMPOSITIONS CONTAINING NITROTHIOPHENES, AND USE THEREOF

Hendrik Dolman, and Johannes Kuipers, both of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

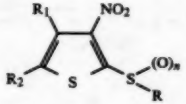
Division of Ser. No. 361,758, Mar. 25, 1982, Pat. No. 4,451,660, which is a continuation-in-part of Ser. No. 217,172, Dec. 16, 1980, abandoned. This application Oct. 20, 1983, Ser. No. 543,895

Claims priority, application Netherlands, Dec. 19, 1979, 7909124

Int. Cl.[4] A01N *43/02*

U.S. Cl. 514—445 11 Claims

1. A fungicidal and/or bactericidal composition, comprising (a) a fungicidally and/or bactericidally effective amount of a compound of the formula



wherein

R is selected from the group consisting of

C_1–C_{12} alkyl,

Phneyl-substituted C_1–C_{12} alkyl

substituted phenyl-substituted C_1–C_{12} alkyl wherein the phenyl substituent is selected from the group consisting of nitro, a halogen atom, C_1–C_4 alkyl, and C_1–C_4 alkoxy,

C_2–C_5 alkoxy carbonyl-substituted C_1–C_{12} alkyl,

thiocyanato-substituted C_1–C_{12} alkyl,

phneyl,

phenyl substituted with a member selected from the group consisting of nitro, a halogen atom, C_1–C_4 alkyl, and C_1–C_4 alkoxy,

pyridyl,

pyridyl substituted with a member selected from the group consisting of nitro, a halogen atom, C_1–C_4 alkyl, and C_1–C_4 alkoxy,

N-oxypyridyl, and

N-oxypyridyl substituted with a member selected from the group consisting of nitro, a halogen atom, C_1–C_4 alkyl, and C_1–C_4 alkoxy;

R_1 is selected from the group consisting of

a hydrogen atom,

a halogen atom,

C_1–C_4 alkyl,

phenyl, and

phenyl substituted with a member selected from the group consisting of nitro, a halogen atom, C_1–C_4 alkyl, and C_1–C_4 alkoxy;

R_2 is selected from the group consisting of

a hydrogen atom,

C_1–C_4 alkyl,

cyano,

C_1–C_5 alkanoyl,

C_3–C_{10} α, α-dialkoxyalkyl,

C_3–C_{10}α, α-alkylenedioxyalkyl,

carboxy,

C_2–C_5 alkoxycarbonyl,

C_1–C_4 α-hydroxyalkyl,

C_1–C_4 α-haloalkyl,

C_2–C_6 α-alkoxyalkyl,

C_2–C_5 alkoxycarboximidoyl

sulpho,

aminosulphonyl,

C_1–C_4 alkylaminosulphonyl,

C_2–C_8 dialkylaminosulphonyl, and

C_1–C_4 alkoxysulphonyl; and

n is 1 or 2,

with the proviso that when R_1 and R_2 are hydrogen atoms, n is 1, and (b) a liquid or solid inert carrier.

4,649,155

INJECTABLE SOLUTIONS

Hans Steffen, Arisdorf, and Alberto Ferro, Riehen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jul. 16, 1984, Ser. No. 631,264

Claims priority, application Switzerland, Jul. 22, 1983, 4029/83; Jun. 6, 1984, 2747/84

Int. Cl.[4] A61K *31/355*

U.S. Cl. 514—458 4 Claims

1. An injectable aqueous micellar solution comprising vitamin E, a phospholipid and a cholanic acid or salt thereof, wherein the molar ratio phospholipid: cholanic acid is about 0.2–0.9:1 and the solution contains at least about 100 g of vitamin E per mol of phospholipid; or lyophilizates thereof.

4,649,156

6-NITROPROSTAGLANDIN DERIVATIVES

Toshio Tanaka; Atsuo Hazato, both of Hino, and Seizi Kurozumi, Kokubunji, all of Japan, assignors to Teijin Limited, Osaka, Japan

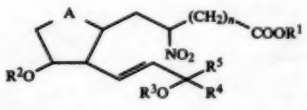
Continuation of Ser. No. 525,904, Aug. 24, 1983, abandoned. This application Jul. 19, 1985, Ser. No. 756,574

Claims priority, application Japan, Aug. 24, 1982, 57-145528; Aug. 24, 1982, 57-145529; Jun. 13, 1983, 58-104320; Jun. 30, 1983, 58-116999

Int. Cl.[4] A61K *31/215, 31/25*; C07C *69/74*

U.S. Cl. 514—530 14 Claims

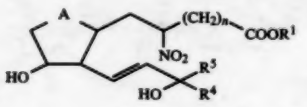
1. A 6-nitroprostaglandin derivative of the following formula (I)



(I)

wherein A represents a carbonyl group or a hydroxymethylene group; n represents an integer of 1 to 4; R^1 represents a hydrogen atom, a C_1–C_{10} alkyl group, a substituted or unsubstituted phenyl group, a substituted or unsubstituted C_5–C_8 alicyclic group, a substituted or unsubstituted phenyl (C_1–C_2) alkyl group, or one equivalent of a cation; R^2 and R^3 are identical or different and each represents a hydrogen atom, a tri(C_1–C_7) hydrocarbon-silyl group, or a group forming an acetal linkage together with the oxygen atom of the hydroxyl group; R^4 represents a hydrogen atom, a methyl group, an ethyl group, a vinyl group, or an ethynyl group; R^5 represents an unsubstituted C_5–C_8 alkyl group, a substituted C_1–C_5 alkyl group substituted by a substituent selected from the group consisting of substituted or unsubstituted phenyl, a substituted or unsubstituted phenoxy and a substituted or unsubstituted C_5–C_6 cycloalkyl, or a substituted or unsubstituted C_5–C_8 alicyclic group, and the substiutents of said substituted phenyl, C_5–C_8 alicyclic and phenyl (C_1–C_2) alkyl group of R^1 and of said substituted phenyl, substituted phenoxy, substituted C_5–C_6 cyclolkyl and substituted C_5–C_8 alicyclic group of R^5 are selected from the group consisting of a halogen atom, a hydroxyl group, a C_2–C_7 acyloxy group, a C_1–C_4 alkyl group, a C_1–C_4 alkyl group substituted by a halogen atom, a C_1–C_4 alkoxy group, a C_1–C_4 alkoxy group substituted by a halogen atom, a nitrile group, a carboxyl group and a (C_1–C_6) alkoxycarbonyl group.

9. A pharmaceutical composition for controlling vascular action comprising (1) as an active ingredient a 6-nitroprostaglandin derivative of the following formula (I)-1



(I)-1

wherein A, n, R^1, R^4 and R^5 are as defined with regard to formula (I) of claim 1,
and (2) a pharmaceutically acceptable carrier.

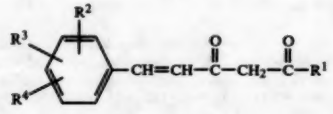
4,649,157

PHARMACEUTICAL COMPOSITIONS CONTAINING 5-PHENYL-1,3-DIOXOALKENYL COMPOUNDS

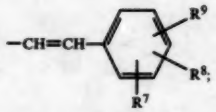
Richard A. Partis, Evanston, and Richard A. Mueller, Glencoe, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Mar. 28, 1986, Ser. No. 845,309
Int. Cl.[4] A61K *31/235*
U.S. Cl. 514—545 **39 Claims**

1. A method for treating allergic reactions or inflammatory conditions in mammals comprising administering to a mammal in need of such treatment a therapeutically effective amount of a compound of the formula:



wherein R^1 is:
(a) hydrogen;
(b) C_1–C_{10} alkyl;
(c) C_1–C_6 alkoxy;
(d) NR^5R^6; wherein R^5 and R^6, each being the same or different, are:
(i) hydrogen; or
(ii) C_1–C_{10} alkyl;
(e) phenyl or phenyl substituted with 1 to 3 substituents selected from the group consisting of:
(i) C_1–C_{10} alkyl;
(ii) C_1–C_6 alkoxy;
(iii) nitro, with the proviso that only one such substituent may be nitro; or
(iv) halogen;
(f) phenoxy or phenoxy substituted with 1 to 3 substituents selected from the group consisting of:
(i) C_1–C_{10} alkyl;
(ii) C_1–C_6 alkoxy;
(iii) nitro, with the proviso that only one such substituent may be nitro; or
(iv) halogen;
(g)



wherein R^7, R^8, and R^9 each being the same or different, are:
(i) hydrogen;
(ii) C_1–C_{10} alkyl;
(iii) C_1–C_6 alkoxy;
(iv) benzyl;
(v) phenoxy or phenoxy substituted with 1 to 3 substituents selected from the group consisting of:
(A) C_1–C_{10} alkyl;
(B) C_1–C_6 alkoxy; or
(C) halogen;
(vi) nitro, with the proviso that only one of R^7, R^8, and R^9 may be nitro;
(vii) halogen;
(viii) hydroxyl; or
(ix) R^7 and R^8 together are —CH=CH—CH=CH—;
wherein R^2, R^3, and R^4, each being the same or different, are:
(a) hydrogen;
(b) C_1–C_{10} alkyl;
(c) C_1–C_6 alkoxy;
(d) benzyl;
(e) phenoxy or phenoxy substituted with 1 to 3 substitutents selected from the group consisting of:
(i) C_1–C_{10} alkyl;
(ii) C_1–C_6 alkoxy; or
(iii) halogen;
(f) nitro, with the proviso that only one of R^2, R^3, and R^4 may be nitro;
(g) halogen;
(h) hydroxyl; or
(i) R^2 and R^3 together are —CH=CH—CH=CH—.

4,649,158

NOVEL SALTS OF 1-(AMINODIHALOPHENYL)-2-AMINOETHANOLS AND ANTILIPOGENIC COMPOSITIONS PREPARED THEREFROM

Goro Asato, Titusville, and Lawrence J. Ross, Martinsville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 462,746, Feb. 1, 1983, Pat. No. 4,552,897. This application Oct. 7, 1985, Ser. No. 785,621
Int. Cl.[4] A61K *31/205*
U.S. Cl. 514—554 **1 Claim**

1. A method for increasing the weight gain of warm-blooded animals and improving the lean meat to fat ratio of said animal comprising: incorporating as an active ingredient in the diet of said animals about 1 to 250 ppm of the salt 1-(4'-amino-3',5'-dichlorophenyl)-2-t-butylaminoethanol oleate.

4,649,159

PHARMACEUTICAL COMPOSITION COMPRISING L-CARNITINE FOR THE TREATMENT OF IMPAIRED CARDIAC FUNCTION

Ottorino Fanelli, Ariccia, Italy, assignor to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

Continuation of Ser. No. 558,563, Dec. 5, 1983, abandoned, which is a continuation of Ser. No. 187,654, Sep. 16, 1980, abandoned. This application Jun. 12, 1985, Ser. No. 743,763
Claims priority, application Italy, Sep. 21, 1979, 50332 A/79
Int. Cl.[4] A61K *31/205*
U.S. Cl. 514—556 4 Claims

1. A therapeutical method for the treatment of patients affected by arrhythmic syndromes and congestive heart failure, characterized by the fact of administering to said patients, via the oral or parenteral route, a pharmaceutical composition comprising an effective amount of L-carnitine substantially free of D-carnitine.

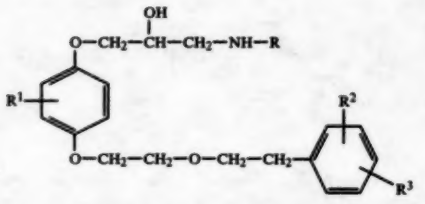
4,649,160

SUBSTITUTED PHENOXY-AMINOPROPANOLS

Peter J. Machin, London, United Kingdom, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

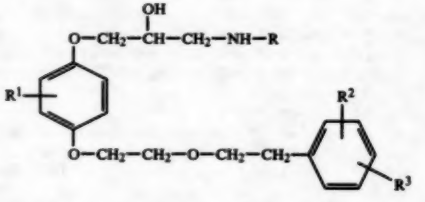
Continuation of Ser. No. 505,504, Jun. 17, 1983, abandoned, which is a continuation of Ser. No. 267,497, May 28, 1981, abandoned. This application Sep. 6, 1985, Ser. No. 773,390
Claims priority, application United Kingdom, May 2, 1980, 8017583; Mar. 17, 1981, 8108345
Int. Cl.[4] A61K *31/135*
U.S. Cl. 514—652 15 Claims

1. A compound of the formula



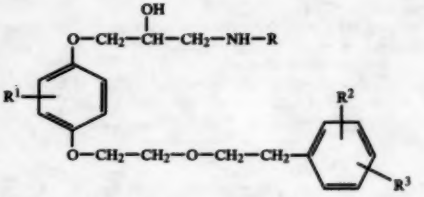
wherein R is a branched-chain alkyl of 3 or 4 carbons, R^1 is hydrogen or fluorine and R^2 is fluorine and R^3 is hydrogen or fluorine, or a pharmaceutically acceptable acid addition salt thereof.

9. A method of treating angina pectoris which comprises administering an effective amount of a compound of the formula



wherein R is a branched-chain alkyl of 3 or 4 carbon atoms, R^1 is hydrogen or fluorine and R^2 is fluorine and R^3 is hydrogen or fluorine, or a pharmaceutically acceptable salt thereof.

11. A method of treating cardiac arrhythmias which comprises administering an effective amount of a compound of the formula



wherein R is a branched-chain alkyl of 3 or 4 carbon atoms, R^1 is hydrogen or fluorine and R^2 is fluorine and R^3 is hydrogen or fluorine, or a pharmaceutically acceptable acid addition salt thereof.

15. A compound, in accordance with claim 1, selected from the group consisting of 1-[2-fluoro-4-[2-(4-fluorophenethyloxy)ethoxy]phenoxy]-3-isopropylamino-2-propanol, 1-[3-fluoro-4-[2-(4-fluorophenthyloxy)ethoxy]phenoxy]-3-isopropylamino-2-propanol, 1-[4-[2-(2,4-difluorophenethyloxy)ethoxy]phenoxy]-3-isopropylamino-2-propanol or a pharmaceutically acceptable acid addition salt thereof.

4,649,161

METHOD FOR TREATING DEPRESSION WITH D-FENFLURAMINE

Richard J. Wurtman; Judith J. Wurtman, both of Boston, and Dermot O'Rourke, Charlestown, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 16, 1986, Ser. No. 874,609
Int. Cl.[4] A61K *31/135*
U.S. Cl. 514—654 2 Claims

1. A method for treating human patients having bipolar depression which consists of administering to said patient a unit dosage from of a composition which comprises between about 2.5 mg and 120 mg per day of the dextro optically active isomer of 1-(meta-trifluoromethylphenyl)-2-ethylaminopropane or a physiologically acceptable salt thereof in admixture with an inert non-toxic carrier.

4,649,162

PROCESS FOR THE PREPARATION OF CELLULAR OR NONCELLULAR PLASTICS FROM AT LEAST TWO COMPONENTS WHICH REACT WITH ONE ANOTHER

Peter Roche, Munich, and Mathaeus Rank, Olching/Neu-Esting, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 23, 1986, Ser. No. 821,708
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1985, 3502938
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—78 10 Claims

1. A process for the preparation of cellular or noncellular plastics by reacting at least two components with each other, by feeding the components into a mixing zone separately, and mixing them together, then discharging the reaction mixture from the mixing zone while adding air heated to a temperature of 100° C. to 1200° C. to the reaction.

4,649,163

FLAME-RETARDANT POLYURETHANE FOAM AND POLYOL COMPOSITION THEREFOR

Yoshihiko Tairaka, Sakai, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 3, 1985, Ser. No. 804,254
Claims priority, application Japan, Dec. 7, 1984, 59-259774
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—107 5 Claims

1. A polyol composition for polyurethane production, which comprises

(a) a polyether polyol with an average molecular weight of 2,000 to 10,000,
(b) an adduct of a carboxylic acid having not less than 8 carbon atoms with ethylene oxide or both ethylene oxide and propylene oxide and
(c) a diol with an average molecular weight of 62 to 400, having one or more primary hydroxyl groups

in a ratio of (88 to 98):(2 to 8):(0 to 4) by weight.

4,649,164

FOAMED POLYMERIC MATERIALS

Laurie J. Scott; Robert E. Erickson, and Theodore C. Wallace, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 633,833, Jul. 24, 1984, Pat. No. 4,529,739. This application Jul. 3, 1985, Ser. No. 752,205

Int. Cl.[4] C08J 9/30

U.S. Cl. 521—149 **14 Claims**

1. A foamed, open-celled water-swellable polymeric absorbent material containing a plurality of neutralized acid moieties prepared by a process comprising contacting a polymer comprising from about 40 to about 50 weight percent of monomers containing pendant acid moieties in acid form which are polymerized to form the polymer, said polymer being capable of absorbing more than 15 times its weight in aqueous liquid with an acid-neutralizing blowing agent so as to neutralize an effective amount of the pendant acid moieties.

4,649,165

DENTAL FILLING MATERIAL COMPRISING POLYMERIZABLE (METH)ACRYLIC COMPOUND, X-RAY OPAQUE FILLERS AND MICROFILLER

Werner Kuhlmann, Mainz-Hechtscheim, Fed. Rep. of Germany, assignor to Blendax-Werke R. Schneider GmbH & Co., Mainz, Fed. Rep. of Germany

PCT No. PCT/EP85/00024, § 371 Date Sep. 27, 1985, § 102(e) Date Sep. 27, 1985, PCT Pub. No. WO85/03220, PCT Pub. Date Aug. 1, 1985

PCT Filed Jan. 26, 1985, Ser. No. 782,713

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1984, 3403040

Int. Cl.[4] A61K 6/06

U.S. Cl. 523—116 **9 Claims**

1. Dental filling material comprising (i) one or more polymerizable (meth) acrylic compounds, (ii) polymerization accelerators, polymerization initiators or mixtures thereof and about 60 to 90% by weight, based on the total composition, of an inorganic filler mixture of at least two X-ray opaque fillers with different particle size distribution which comprises:
(a) about 5 to 20% by weight, based on the total filler mixture, of at least one X-ray opaque filler with a particle size distribution of between 0.5 to 40 micrometers,
(b) about 20 to 40% by weight, based on the total filler mixture, of at least one X-ray opaque filler with a particle size distribution of between 0.2 and 15 micrometers, and
(c) about 40 to 75% by weight, based on the total filler mixture, of at least one microfiller with a particle size distribution between 5 and 150 nanometers.

4,649,166

PAVING COMPOSITION CONSISTING ESSENTIALLY OF CLAY AND AN ACRYLIC LATEX EMULSION

Stefano T. De Fatis, Viale dei Primati Sportivi, 27, 00144 Roma, Italy

Filed Oct. 16, 1984, Ser. No. 661,578

Int. Cl.[4] C08L 1/00; C08K 3/34

U.S. Cl. 524—35 **7 Claims**

1. A paving material comprising at least about 75% clay as an inert ground substance, the remainder consisting essentially of an acrylic latex emulsion wherein the clay has been baked at a temperature ranging from 600° C. to 1400° C. and ground to a desire grain size.

4,649,167

SULFONE-CONTAINING HINDERED AMINES

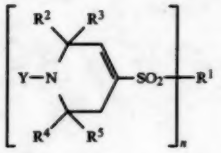
Ludwig K. Huber, Wayne, and James L. Reilly, Landsdale, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Nov. 14, 1985, Ser. No. 799,532

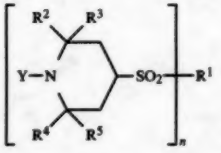
Int. Cl.[4] C08K 5/34; C07D 403/12, 403/14

U.S. Cl. 524—99 **14 Claims**

1. A compound of the formula (I) or (II) and the salts thereof



I



II

where

R^1 is selected from the group of alkyl having 1 to 30 carbons, cycloalkyl or cycloalkenyl having 3 to 20 carbons, cycloalkylalkyl having 4 to 30 carbons, aryl having 6 to 30 carbons and alkylaryl or arylalkyl having 7 to 30 carbons, which radicals may optionally be substituted with substituents from the group of halogen, OH, OR, O_2CR, CO_2R, $CONH_2$, CONR, CONHR, NH_2, NR_2, NHR, SR, SOR, SO_2R, SO_2NR_2, SO_2NH_2, SO_2NHR, or may contain as linking groups —O—, —NH—, —NR—, —CO—, $—CO_2—$, —CONH—, —CONR—, —S—, —SO—, $—SO_2—$, $—CO_2NH—$, and $—SO_2NR—$,

R is selected from the group of alkyl having 1 to 20 carbons, alkenyl having 2 to 20 carbons, cycloalkyl or cycloalkenyl having 3 to 20 carbons, cycloalkylalkyl having 4 to 30 carbons, aryl having 6 to 20 carbons, and alkylaryl having 7 to 30 carbons,

n is an integer of from 1 to 15,

R^2, R^3, R^4 and R^5 are the same or different and are selected from the group of alkyl having 1 to 10 carbons, alkenyl having 2 to 10 carbons, cycloalkyl having 3 to 10 carbons, aryl having 6 to 20 carbons, or alkaryl having 7 to 20 carbons, or R^2 and R^3, and R^4 and R^5 may be linked together to form a ring with 5 to 12 carbons, and

Y is selected from H, OH, O, or a hydrocarbyl radical R, wherein R is defined as above.

8. A composition comprising a polymer resin and an effective amount for stabilizing against degradation by ultraviolet light of the compound of claim 1.

4,649,168

PROCESS FOR THE PREPARATION OF FLAME-RESISTANT POLYCARBONATE MOULDING COMPOSITIONS CONTAINING TETRAFLUOROETHYLENE POLYMERS

Hans-Jürgen Kress; Ludwig Bottenbruch, both of Krefeld, Fed. Rep. of Germany; Mark Witman, Pittsburgh, Pa.; Klaus Kircher, Leverkusen, Fed. Rep. of Germany; Christian Lindner, Cologne, Fed. Rep. of Germany, and Karl-Heinz Ott, Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 13, 1985, Ser. No. 797,531

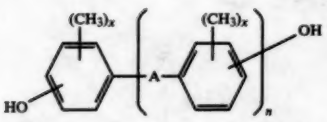
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1984, 3442281

Int. Cl.[4] C08K *5/53;* C08L *69/00*

U.S. Cl. 524—130 10 Claims

1. A process for the preparation of a flame-resistant polycarbonate moulding composition, consisting of

(a) thermoplastic, halogen-free, sulphur-free and phosphorus-free polycarbonate, based on at least 1 diphenol of the formula



wherein A is a single bond, C_1–C_5 alkylene, C_2–C_5 alkylidene or C_5–C_6 cycloalkylidene, x is 0, 1 or 2 and n is 1 or 0,

(b) an alkali metal salt of an organic or inorganic acid,

(c) tetrafluoroethylene polymer with mean particle sizes from 0.05 μm to 20 μm, and

(d) halogen-free graft polymer comprising:

(1) 5 to 90 parts by weight of a mixture of

(i) 50 to 95% by weight of styrene, α-methyl-styrene, nuclear-substituted styrene, methyl methacrylate, or mixtures thereof, and

(ii) 50 to 5% by weight of (meth)acrylonitrile, methyl methacrylate, maleic anhydride, N-substituted maleimide, or mixtures thereof, onto

(2) 95 to 10 parts by weight of a rubber having a glass temperature $T_G \leqq 10°$ C.,

where the component

(a) is present in amounts of 86 to 99.85% by weight, component

(b) is present in amounts of 0.02 to 1% by weight, component

(c) is present in amounts of 0.05 to 5% by weight, and component

(d) is present in amounts of 0.08 to 8% by weight, and where the total of components (a)+(b)+(c)+(d) is, in each case, 100% by weight, in which the components (a) to (d) are, after having been mixed, melt-compounded or melt-extruded at temperatures of 260° C. to 320° C., component

(e) being used in the form of a coagulated mixture of emulsions of the tetrafluoroethylene polymer (c) with emulsions of the graft polymer (d), the ratio of mixing of component (c) to component (d) being between 5:95 and 40:60 in each case.

4,649,169

CROSSLINKED VINYL POLYMER COMPOSITIONS AND PROCESS FOR PREPARING MOLDED SHAPED ARTICLES

John A. Thompson, Milwaukee, Wis., and Christopher B. Keogh, Winston-Salem, N.C., assignors to Henkel Corporation, Minneapolis, Minn.

Filed Sep. 10, 1984, Ser. No. 649,016

Int. Cl.[4] C08L *61/28*

U.S. Cl. 524—247 7 Claims

1. A liquid composition for treating and molding fibrous substrates into shaped articles comprising:

(a) from about 40% to about 60% by weight of carboxylated polystyrene having a glass transition temperature in excess of 35° C.;

(b) from about 2.5% to about 12% of an alkylated melamine formaldehyde resin;

(c) from about 15 to about 60% by weight water;

(d) a sufficient amount of a fugitive base to maintain an alkaline pH, and

(e) from about 15 to about 25% by weight of polyvinyl acetate.

4,649,170

ABRASION RESISTANT LATEX UNDERBODY COATING

William F. Reid, Willow Wood, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Apr. 25, 1985, Ser. No. 727,140

Int. Cl.[4] C09D *5/08, 3/80;* C08K *3/26*

U.S. Cl. 524—247 28 Claims

1. A water-borne, anticorrosive, antiabrasive, storage stable and rapidly drying coating composition capable of application and flow on a solid substrate, comprising:

(a) about 0.5 to 10% by weight of an alkylalkoxy amine, said amine being present in sufficient amount so that the coating composition has a pH within the range of 8.5 to 9.5;

(b) about 1 to 5% coalescing agent;

(c) about 30 to 70% of acrylic latex.

4,649,171

POLYOLEFIN MOLDING COMPOSITION

Martin Bonnke, Hattersheim am Main, and Lothar Bothe, Mainz, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 2, 1985, Ser. No. 751,070

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1984, 3424695

Int. Cl.[4] C08K *5/05, 5/09;* C08L *23/12*

U.S. Cl. 524—381 5 Claims

1. A polyolefin molding composition, consisting essentially of a propylene homopolymer, and 0.01 to 0.045% by weight, based on the polymer, of a potassium or sodium salt of citric acid.

4,649,172

POLYACETAL RESIN COMPOSITION

Yukimasa Yanase, Nishinomiya, and Tsuneyoshi Okada, Fuji, both of Japan, assignors to Polyplastics Co., Ltd., Japan

Filed Apr. 19, 1985, Ser. No. 725,192

Claims priority, application Japan, Apr. 19, 1984, 59-79289

Int. Cl.[4] C08K *3/34, 3/10*

U.S. Cl. 524—413 5 Claims

1. A polyacetal resin composition which comprises a polyacetal, a potassium titanate fiber and a fluororesin abrasion resisting agent.

4,649,173

WATER REDUCIBLE PHENOLIC MODIFIED ALKYD RESIN

Roger A. Schmidt, Chanhassen, Minn., assignor to Cargill, Incorporated, Minneapolis, Minn.

Filed Sep. 27, 1985, Ser. No. 781,096
Int. Cl.[4] C08L 67/08
U.S. Cl. 524—539 14 Claims

1. A coating composition comprising:

at least one pigment;

water; and

a water reducible alkyd resin free of aminoplasts or amino cross-linking agents, the water reducible alkyd resin including

a resin which is a reaction product of from about 15 to about 50 parts by weight based per 100 weight of the resulting water reducible alkyd of a dibasic acid or an acid anhydride thereof, about 20 to about 50 parts by weight per 100 weight of resulting alkyd of polyol containing at least two hydroxyl groups per molecule, from about 15 to about 60 parts by weight per 100 weight of resulting alkyd of a monobasic carboxylic acid and from about 3 to about 15 parts by weight per 100 weight of resulting alkyd tricarboxylic acid or acid anhydride thereof, and from about 4 to about 20 parts by weight per 100 weight of resulting alkyd of an alkylated phenol resin which is not heat reactive in said coating composition to provide a water reducible alkyd coating composition which is free of aminoplasts or amino cross-linking agents.

4,649,174

COLORING COMPOSITION

Kazutoshi Akiyama, Matsubara, and Takashi Ono, Takatsuki, both of Japan, assignors to Orient Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 13, 1984, Ser. No. 670,870
Claims priority, application Japan, Nov. 22, 1983, 58-220447
Int. Cl.[4] C08L 79/02
U.S. Cl. 524—841 20 Claims

1. A coloring composition prepared by a process comprising reacting:

a vinyl compound soluble in water or in a water soluble organic solvent; and

a compound which contains at least two groups having an active hydrogen, wherein at least one group of said compound is an amino group or imino group in the presence of a water soluble dye, at an elevated temperature or in the presence of a catalyst.

4,649,175

THERMOSETTING ALKYD RESIN COATING COMPOSITION

Hiroshi Inoue, Hiratsuka, and Yoshio Sasaki, Kanagawa, both of Japan, assignors to Kansai Paint Company, Limited, Amagasaki, Japan

Filed Jul. 17, 1985, Ser. No. 755,762
Claims priority, application Japan, Jul. 18, 1984, 59-148856
Int. Cl.[4] C08G 63/76
U.S. Cl. 525—38 8 Claims

1. In a thermosetting alkyd resin coating composition consisting essentially of (A) an alkyd resin or a fatty acid-modified alkyd resin obtained by reacting a polybasic acid component with a polyhydric alcohol component using or without using a fatty acid conjointly with the components and (B) a crosslinking agent, the composition which is characterized in that the polyhydric alcohol component comprises an alkanolamine having at least two hydroxyl groups in the molecule.

4,649,176

SERVING TRAY ARTICLE COMPRISING A BLEND OF A SULFONE, STYRENE AND A POLYCARBONATE

Tyler F. Hartsing, Jr., 2404 Bryant Ave., Westfield, N.J. 07090, and Marvin E. Sauers, Township Line Rd., #1, Belle Mead, N.J. 08502

Filed Jan. 13, 1986, Ser. No. 818,560
Int. Cl.[4] C08L 69/00, 51/00
U.S. Cl. 525—67 9 Claims

1. A serving tray fabricated from a blend comprising from about 20 to about 85 weight percent of a poly(aryl ether)sulfone polymer, from about 80 to about 15 weight percent of a styrene polymer, and a compatibilizing amount of a polycarbonate.

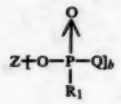
4,649,177

PROCESS FOR THE PREPARATION OF NYLON BLOCK POLYMERS

James D. Gabbert, St. Louis; Albert Y. Garner, Manchester, and Ross M. Hedrick, St. Louis, all of Mo., assignors to DM Rim Nylon Vof, Maastricht, Netherlands

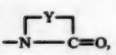
Continuation of Ser. No. 467,625, Feb. 18, 1983, abandoned, which is a continuation-in-part of Ser. No. 374,853, May 4, 1982, abandoned, which is a continuation-in-part of Ser. No. 274,331, Jun. 16, 1981, abandoned. This application Sep. 11, 1985, Ser. No. 774,761
Int. Cl.[4] C08G 69/14
U.S. Cl. 525—408 82 Claims

1. A process for preparing a nylon block copolymer which comprises bringing together and reacting lactam monomer, basic lactam polymerization catalyst and a lactam functional material of the formula:



wherein:

Q is



with Y equal to C_3–C_{11} alkylene;

b is an integer equal to 2 or more;

R_1 is an alkyl, aryl, aralkyl, halogen alkyloxy, aryloxy, or aralkyloxy group;

Z is a segment of: (1) a polyether, provided said polyether is not solely polyarylene polyether; (2) a polyester containing polyether or polymeric hydrocarbon segments; (3) a hydrocarbon; (4) a polysiloxane; or (5) mixtures thereof.

4,649,178

PROCESS FOR PRODUCING BROMINATED BUTYL RUBBER HIGH IN PRIMARY ALLYLIC BROMINE

Irwin J. Gardner, Scotch Plains, and James V. Fusco, Red Bank, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 1, 1984, Ser. No. 656,667
Int. Cl.[4] C08F 8/20
U.S. Cl. 525—306 11 Claims

1. A process for preparing a brominated butyl rubber having a substantial fraction of incorporated bromine in a primary allylic configuration (type III) which comprises contacting a butyl rubber dissolved in a solvent with bromine at a reaction temperature of about 65° C. to about 130° C. for a time sufficient to brominate the polymer.

4,649,179

POLYACETAL RESIN COMPOSITION

Hitohisa Takagaki, Fuji, Japan, assignor to Polyplastics Co., Ltd., Osaka, Japan

Filed Jul. 22, 1985, Ser. No. 757,589
Claims priority, application Japan, Jul. 24, 1984, 59-153668
Int. Cl.[4] C08L 61/02, 67/00
U.S. Cl. 525—400 8 Claims

1. A polyacetal resin composition which comprises a blend of the following individual components:
(a) polyacetal; and
(b) an ester of a fatty acid having 12 or more carbon atoms and a polyalkylene glycol having an average polymerization degree of 16 or more.

4,649,180

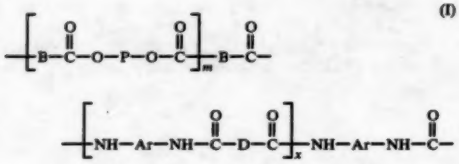
POLYAMIDE-POLY-CARBONATE BLOCK COPOLYMERS

Augustin T. Chen, Cheshire, and Kemal Onder, North Haven, both of Conn., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 17, 1986, Ser. No. 840,248
Int. Cl.[4] C08F 283/02
U.S. Cl. 525—462 14 Claims

1. A substantially linear segmented thermoplastic polyester-amide characterized by the combination of excellent hydrolytic stability, thermal stability, and low temperature flexibility, said polyester-amide having a recurring unit of the formula:

(I)



wherein Ar is an arylene radical, P is the residue of a precursor polycarbonate diol HOPOH having a molecular weight from about 400 to about 4000, B is the residue of a dicarboxylic acid HOOC—B—COOH selected from the class consisting of aliphatic dicarboxylic acids having 6 to 14 carbon atoms, inclusive, isophthalic, and terephthalic acids, m has a mean value of less than 1 and greater than 0, D is the residue of a dicarboxylic acid HOOC—D—COOH such that the melt temperature of the hard segment is not greater than about 325° C., and x is a number having an average value from 0 to 10.

4,649,181

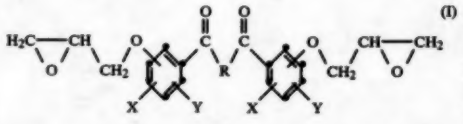
GLYCIDYLOXY DIKETONES

Roland Darms, Therwil, and Charles E. Monnier, Villars-sur-Glâne, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 1, 1985, Ser. No. 718,575
Claims priority, application Switzerland, Apr. 4, 1984, 1693/84
Int. Cl.[4] C08F 283/00
U.S. Cl. 525—524 16 Claims

1. A compound of the formula I

(I)



wherein the substituents X independently of one another are hydrogen, alkyl having 1 to 6 C atoms, glycidyloxy or alkoxy having 1 to 6 C atoms, the substituents Y independently of one another are hydrogen or alkyl having 1 to 6 C atoms and R is a direct bond, a group of the formula $—C_mH_{2m}—$, $—C_nH_{2n-2}—$ or $—C_nH_{2n-4}—$ in which m=1–12 and n=2–12, a divalent, saturated or unsaturated cycloaliphatic radical having up to 14 C atoms, a divalent araliphatic radical having up to 14 C atoms, a divalent C_6–C_{12} aromatic radical or a group of the formula II

(II)

in which T is a direct bond, methylene, isopropylidene, O, S, NH, CO or SO_2.

7. A curable mixture which comprises
(a) a compound of the formula I according to claim 1, and
(b) as curing agent a polyamine, a polyphenol, a polycarboxylic acid, a polycarboxylic acid anhydride, or as a compound having catalytic action a tin salt of an alkanoic acid or a Friedel-Crafts catalyst, the amounts of the curing agent employed being such that 0.75 to 1.25 equivalents of amine hydrogen or of phenolic hydroxyl group, or 0.4 to 1.1 equivalents of carboxyl group or anhydride group are used per 1 equivalent of epoxy group, or that 1 to 40 parts by weight of curing agent having catalytic action are used per 100 parts by weight of epoxy resin, and optionally as curing catalyst an effective amount of a tertiary amine, a salt thereof, a quaternary ammonium compound or an alkali metal alcoholate.

4,649,182

POLYMERIZATION CATALYSTS AND METHODS OF PREPARATION THEREOF

André Delbouille, and Jean-Louis Derroitte, both of Brussels, Belgium, assignors to Solvay & Cie, Brussels, Belgium

Continuation of Ser. No. 549,021, Feb. 11, 1975, abandoned, which is a continuation of Ser. No. 235,775, Mar. 17, 1972, abandoned, which is a continuation of Ser. No. 808,638, Mar. 19, 1969, abandoned. This application Aug. 22, 1985, Ser. No. 768,173
Claims priority, application France, Mar. 22, 1968, 145133
Int. Cl.[4] C08F 4/02, 10/00
U.S. Cl. 526—125 35 Claims

7. A catalyst for the polymerization and copolymerization of olefins comprising an organometallic compound selected from the group consisting of the organo-metallic derivatives of the elements of Groups I, II, IIIa and IVa of the Periodic Table and a solid catalytic component comprising the reaction product between a transition metal derivative selected from the group consisting of halides, oxyhalides, alkoxyhalides, oxyalkoxides and alkoxides of the metals of Groups IVb, Vb and VIb of the Periodic Table and a hydrated dihalide of a bivalent metal selected from the group consisting of magnesium, calcium, chromium, manganese, iron, nickel, cobalt, copper, zinc and cadmium having from about 0.5 to 5 moles of water of hydration per mole of dihalide, said hydrated dihalide being partially hydrolyzed concurrently with the bonding with said transition metal derivative under conditions which prevent overheating leading to solidification of the reaction mixture.

4,649,183

CALCIUM-TOLERANT N-SUBSTITUTED ACRYLAMIDES AS THICKENERS FOR AQUEOUS SYSTEMS

Charles L. McCormick, and Kenneth P. Blackmon, both of Hattiesburg, Miss., assignors to University of Southern Mississippi, Hattiesburg, Miss.

Continuation-in-part of Ser. No. 743,857, Jun. 12, 1985, Pat. No. 4,584,358. This application Dec. 10, 1985, Ser. No. 807,405
The portion of the term of this patent subsequent to Apr. 22, 2003, has been disclaimed.
Int. Cl.[4] C08F *120/58*
U.S. Cl. 526—240 **35 Claims**

1. A random polymer which contains moities which comprise, by mole percent:
(a) from about 1 to 99 percent of acrylamide;
(b) from about 1 to 99 percent of an acrylamido-substituted alkanoic acid or alkali metal salt thereof; and
(c) from 0 to about 30 percent of one or more copolymerizable olefinically unsaturated monomers having at least one polymerizable ethylenic double bond,
in which the polymer has an average molecular weight greater than about 50,000.

4,649,184

OXYGEN PERMEABLE SOFT CONTACT LENS MATERIAL

Toshiharu Yoshikawa, and Takanori Shibata, both of Nagoya, Japan, assignors to Toyo Contact Lens Co., Ltd., Nagoya, Japan

Filed Dec. 9, 1985, Ser. No. 806,864
Claims priority, application Japan, Dec. 10, 1984, 59-261040
Int. Cl.[4] C08F *30/08*
U.S. Cl. 526—279 **5 Claims**

1. An oxygen permeable soft contact lens material prepared by copolymerizing a mixture comprising (a) a polyorganosiloxane (A) having in its molecular side chains polymerizable groups containing an unsaturated bond and hydrophilic groups containing a hydroxyl group, each of said chains having one said polymerizable group and one said hydrophilic group, and (b) a monomer having a silylated hydroxyl groups as main components, and subjecting the resulting copolymer to desilylation.

4,649,185

CONTACT LENS COMPRISING TRIMETHYLVINYLSILANE POLYMER

Minoru Takamizawa; Akira Yamamoto; Toshinobu Ishihara, and Shigehiro Nagura, all of Niigata, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1985, Ser. No. 798,757
Int. Cl.[4] C08F *30/08*
U.S. Cl. 526—279 **2 Claims**

1. A contact lens which is a lens wearable on the cornea made by shaping a polymeric resin comprising a poly(trimethylvinyl silane) having an average molecular weight of at least 200,000 and wherein the polymeric resin contains at least 50% by weight of a poly(trimethylvinyl silane).

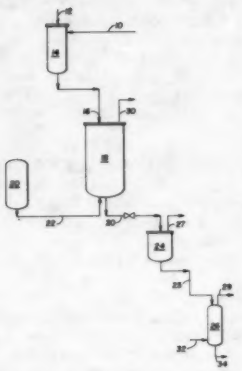
4,649,186

PROCESS FOR PREPARING COPOLYMERS OF ETHYLENE AND VINYL ACETATE

Waylon L. Jenkins, Kingsport; Deborah T. Hodge, Blountville, and Kendree J. Sampson, Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 1, 1985, Ser. No. 750,203
Int. Cl.[4] C08F *2/06*
U.S. Cl. 526—87 **5 Claims**

1. In a process for producing copolymers of ethylene and vinyl acetate in a stirred-tank reactor which contains a reaction mixture comprising ethylene, vinyl acetate, ethylene-vinyl acetate copolymer, catalyst and solvent, and in which reactants are continuously fed into said reactor and reaction mixture having a degree of conversion of 10–50% is continuously withdrawn, the improvement of maintaining the reaction in a steady state condition which comprises the steps of
(a) introducing vinyl acetate and ethylene monomers into the reaction mixture in a ratio such as to result in 20–50 mole % ethylene repeat units in the copolymer, and in a



premixed condition in which ethylene is dissolved in the vinyl acetate;
(b) maintaining the ethylene pressure at about 300–1000 psi and the reaction temperature at about 50°–90° C.; and
(c) continuously purging the free headspace with ethylene to keep the ethylene pressure substantially constant.

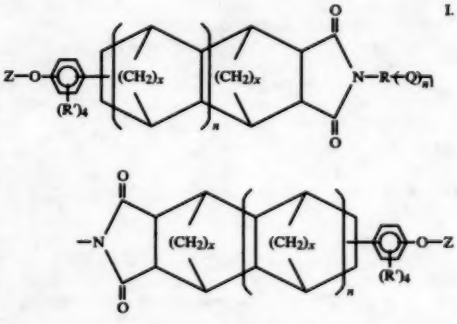
4,649,187

IMIDE FUNCTIONAL POLYPHENOLS; THERMOSETTABLE COMPOSITIONS CONTAINING SAME AND CURED PRODUCTS THEREFROM

Robert E. Hefner, Jr., and Mary N. White, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 679,529, Dec. 7, 1984, Pat. No. 4,555,563. This application Sep. 9, 1985, Ser. No. 773,896
Int. Cl.[4] C08G *59/44, 59/40*
U.S. Cl. 528—117 **21 Claims**

1. A composition resulting from combining
(A) any one or a combination of any two or more of the materials represented by the following formulas (I) and (II)



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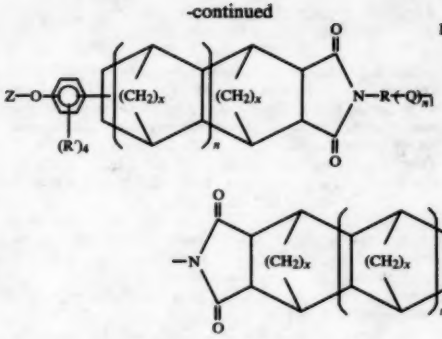
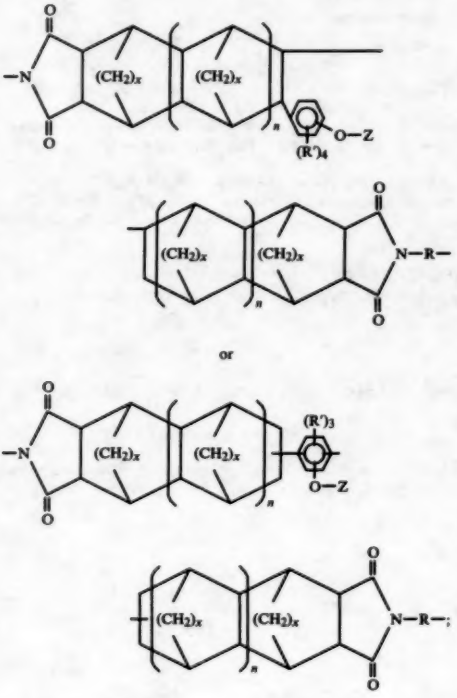
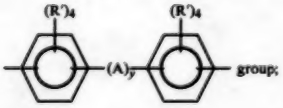
II.



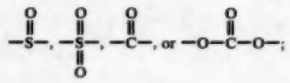
wherein each Q is independently



each R is independently a hydrocarbyl group having from 1 to about 10 carbon atoms, or a



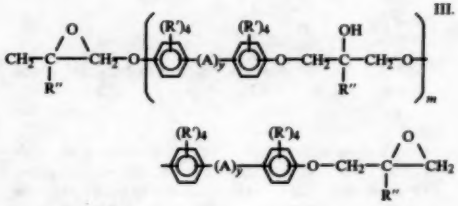
each A is independently a divalent hydrocarbyl group having from 1 to about 10, carbon atoms, —S—, —S—S—, —O—,



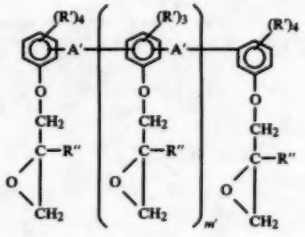
each R′ is independently hydrogen, chlorine, bromine, a hydrocarbyl or hydrocarbyloxy group having from 1 to about 3 carbon atoms; each R″ is hydrogen or a hydrocarbyl group having from 1 to about 3 carbon atoms; Z is —C≡N; each x has a value of zero or 1; each y has a value of zero or 1; each n independently has an average value from zero to about 20, and n^1 has a value from zero to about 10;

(B) at least one polyepoxide represented by the following formulas (III), (IV), (V) or (VI)

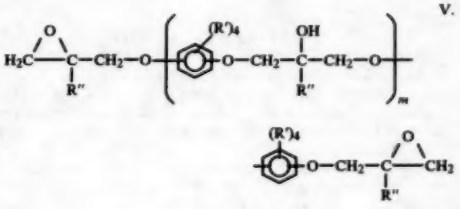
III.



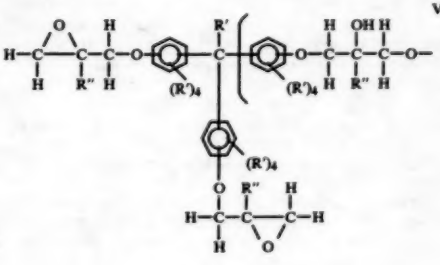
IV.



V.



VI.



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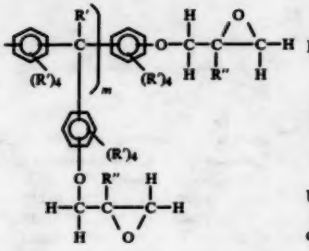
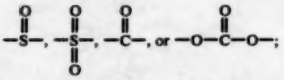


wherein each A is independently a divalent hydrocarbyl group having from 1 to about 10 carbon atoms, —S—, —S—S—, —O—,



each A' is independently a divalent hydrocarbyl group having from 1 to about 10 carbon atoms; each y independently has a value of zero or 1; each R' is independently hydrogen, chlorine, bromine, a hydrocarbyl or hydrocarbyloxy group having from 1 to about 4 carbon atoms; each R'' is independently hydrogen or a hydrocarbyl group having from 1 to about 4 carbon atoms; m has a value from zero to about 40; m' has a value from 0.001 to about 10; and y has a value of zero or 1;

wherein components (A) and (B) are present in an amount to provide a ratio of epoxide groups to groups from about 0.01:1 to about 1:1.

4,649,188

METHOD FOR REDUCING 2-FUNCTIONAL COMPONENTS IN NOVOLAC RESINS AND EPOXY NOVOLAC RESINS PREPARED THEREFROM

James L. Bertram, Lake Jackson; Louis L. Walker, Clute; Avis L. McCrary, Lake Jackson, and Fermin M. Cortez, Sweeny, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 690,702, Jan. 11, 1985. This application Jan. 13, 1986, Ser. No. 818,513

Int. Cl.[4] C08G *8/04*

U.S. Cl. 528—165 **16 Claims**

1. A process for preparing a novolac resin having reduced quantities of 2-functional component, which process comprises

(I) reacting in the presence of a suitable catalyst

(A) a material having at least one aromatic hydroxyl group per molecule with

(B) an aldehyde at a molar ratio of (B):(A) of from about 0.3:1 to about 0.95:1;

(II) removing the excess aromatic hydroxyl-containing material; and

(III) subjecting the product from step (II) to extraction with water until the resultant product contains at least about 25 percent by weight less of 2-functional component than was present after step II.

4,649,189

PROCESS FOR PREPARING PHTHALOCYANINE POLYMER FROM IMIDE CONTAINING BISPHTHALONITRILE

Bappaligе N. Achar, Mysore, India; George M. Fohlen, Millbrae, and John A. Parker, Los Altos, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 565,482, Dec. 22, 1983, abandoned. This application Jul. 12, 1985, Ser. No. 754,362

Int. Cl.[4] C08G *73/10*

U.S. Cl. 528—220 **15 Claims**

1. A process for preparing a thermally stable solid phthalocyanine polymer consisting essentially of the steps of

(a) combining a dicyano aromatic monoamine and an organic dianhydride to produce an amic-acid linked bisphthalonitrile compound;

(b) dehydrocyclizing said amic acid linked bisphthalonitrile compound to produce an imide-linked bisphthalonitrile compound; and

(c) polymerizing said imide-linked bisphthalonitrile compound to produce the desired thermally stable solid phthalocyanine polymer.

4,649,190

POLY(SULFIDE CARBONATE) COMPOSITION AND METHOD FOR THEIR PREPARATION

Robert E. Hefner, Jr., and Mary N. White, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

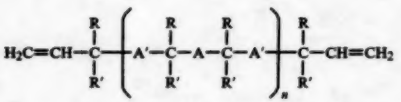
Continuation-in-part of Ser. No. 708,478, Mar. 5, 1985, abandoned, which is a continuation-in-part of Ser. No. 557,973, Dec. 5, 1983, abandoned. This application Feb. 28, 1986, Ser. No. 834,723

Int. Cl.[4] C08G *63/62*

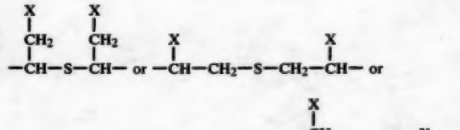
U.S. Cl. 528—370 **21 Claims**

1. Polymer composition represented by the formula

I.

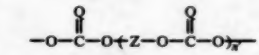


wherein each R and R' are independently hydrogen or a methyl group; each A is independently a group represented by



wherein each X is independently chlorine or bromine; each A' is independently selected from a group represented by the following formulas II, III, IV, V or VI

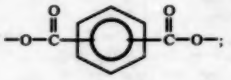
II.



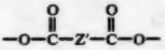
wherein each Q is independently O or S, each Z is a divalent saturated aliphatic hydrocarbon group having from 1 to about 4 carbon atoms or an ether linked alkylene group represented by

and n′ has a value from zero to 4;

III.

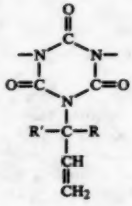


IV.



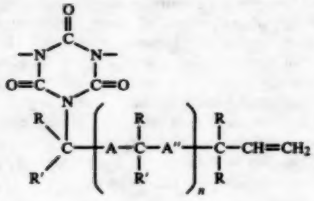
wherein Z′ is a direct bond or Z′ is a divalent saturated aliphatic hydrocarbon group having from 1 to about 8 carbon atoms;

V.



wherein R and R′ are as defined above; or

VI.



wherein A, Q, R and R′ are as defined above; A″ is selected from a group represented by formulas II, III, IV or V; and n has a value from about 2 to about 100; with the proviso that from 5 to 100, percent of the A′ groups are represented by formula II and from zero to 95, percent of the A′ groups are independently represented by the formulas III, IV, V or VI.

4,649,191

CONFORMATIONALLY CONSTRAINED ALPHA-MELANOTROPIN ANALOGS WITH SPECIFIC CENTRAL NERVOUS SYSTEM ACTIVITY

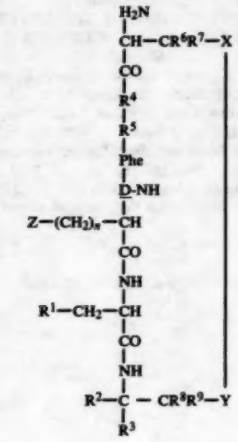
Victor J. Hruby, Tucson, Ariz., assignor to Gibson-Stephens Neuropharmaceuticals, Inc., Tucson, Ariz.

Filed May 10, 1984, Ser. No. 608,708

Int. Cl.⁴ C07K *7/06*

U.S. Cl. 530—329 **12 Claims**

1. A polypeptide which is a cyclic analog of α-MSH and has the formula:



wherein

R^1 is a substituted or unsubstituted aromatic radical;

R^2 is hydrogen or a methyl group;

R^3 is a carboxylate, carboxamide, hydroxymethyl, or aldehyde group;

R^4 is glutamic acid, alanine, -amino butyric acid, valine, leucine or isoleucine;

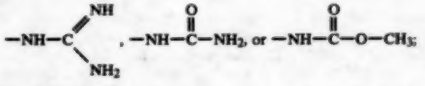
R^5 is histidine, glutamic acid, alanine, valine, leucine or isoleucinei;

R^6 and R^7, which may be the same or different, are hydrogen, methyl or lower alkyl having one to five carbon atoms;

R^8 and R^9, which may be the same or different, are hydrogen, methyl or lower alkyl having one to five carbon atoms;

X and Y are sulfur, methylene, SO, or SO_2;

Z is —NH_2,



and

n is an integer greater than or equal to 2.

4,649,192

METHOD FOR THE ISOLATION AND PURIFICATION OF HEPATITIS B SURFACE ANTIGEN USING POLYSORBATE

Frans Van Wijnendaele, Ottenburg, and Guy Simonet, Perwez, both of Belgium, assignors to Smith Kline-RIT, Belgium

Filed May 30, 1985, Ser. No. 739,415

Int. Cl.⁴ A61K *39/29*; C07K *3/18, 3/28*

U.S. Cl. 530—371 **9 Claims**

1. A method for the isolation and purification of hepatitis B surface antigen by treatment with colloidal silica of the supernatant of engineered yeast cells having produced said antigen and disrupted in the presence of a non ionic detergent which is more particularly a polysorbate which comprises clarifying the supernatant by addition of urea, adsorbing the antigen on the colloidal silica, desorbing therefrom the antigen with a low ionic buffer (pH 8–9.5) supplemented with urea and with a non ionic detergent.

4,649,193

WATER-SOLUBLE DYESTUFFS CONTAINING FIBRE-REACTIVE GROUPS OF THE VINYLSULFONE SERIES AND THE FLUORO-S-TRIAZINYL-AMINO SERIES

Fritz Meininger, Frankfurt am Main; Joachim W. Otten, deceased, late of Offenbach am Main; by Ursula Otten, heir, Heidelberg, and by Anna G. Rudolph née Otten, heir, Dillenburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

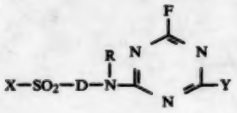
Continuation of Ser. No. 266,370, May 22, 1981, abandoned. This application Aug. 1, 1983, Ser. No. 519,211

Claims priority, application Fed. Rep. of Germany, May 24, 1980, 3019936

Int. Cl.[4] C09B *62/06, 62/085, 62/095, 62/10*

U.S. Cl. 534—622 **4 Claims**

1. A compound containing one or more sulfonic acid groups, of the formula

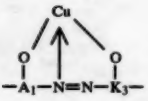


wherein:

D is the radical of an organic dye molecule of the formula

$$-K_2-N=N-A_x-$$

or



in which

A_x is phenylene or phenylene substituted by substituents selected from the group consisting of lower alkyl, lower alkoxy, carboxy, lower alkanoylamino, benzoylamino, sulfo-benzoylamino, phenylamino, sulfophenylamino, carbamoyl, carbamoyl monosubstituted or disubstituted by lower alkyl, phenyl or both, sulfamoyl, sulfamoyl monosubstituted or disubstituted by lower alkyl, phenyl or both, cyano, nitro, chlorine, bromine, fluorine, trifluoromethyl, hydroxy and sulfo, or is a naphthylene unsubstituted or substituted by substituents selected from the group consisting of sulfo, carboxy, methyl, ethyl, methoxy, ethoxy, lower alkanoylamino, benzoylamino, chlorine, hydroxy and nitro,

K_2 is 2-amino-naphthylene or 2-amino-naphthylene substituted by one or two sulfonic acid groups, or

K_2 is pyrazol-5-on-4-yl substituted in the 3-position by methyl, carboxy, carbamoyl, lower carbalkoxy or phenyl, and substituted by phenyl or naphthyl bonded in the 1-position, it being possible for this phenyl to be substituted by 1 or 2 sulfo groups or by 1 or 2 substituents selected from the group consisting of lower alkyl, lower alkoxy, chlorine, bromine, nitro, lower alkanoylamino, substituted alkanoylamino, benzoylamino, substituted benzoylamino and carboxy, or by these groups and by 1 or 2 sulfo groups, and for the naphthyl to be substituted by 1, 2 or 3 sulfo groups or by one substituent selected from the group consisting of lower alkyl, lower alkoxy, nitro, lower alkanoylamino, substituted alkanoylamino, benzoylamino, substituted benzoylamino and carboxy, or by one of these groups and one, two or three sulfo groups,

A_1 is a benzene ring containing no additional substituents or one or two additional substituents (which may be the same or different) selected from the group consisting of lower alkyl, lower alkoxy, carboxy, phenylamino, sulfobenzoylamino, sulfophenylamino, carbamoyl, carbamoyl which is monosubstituted or disubstituted by lower alkyl, phenyl or both, sulfamoyl, sulfamoyl which is monosubstituted or disubstituted by lower alkyl, phenyl or both, cyano, nitro, chlorine, bromine, trifluoromethyl and sulfo, or

A_1 is a naphthalene ring, or a naphthalene ring substituted by 1, 2 or 3 sulfo groups or by a carboxy, methyl, methoxy, ethoxy, nitro, acetylamino or chlorine or by a carboxy, methyl, methoxy, ethoxy, nitro, acetylamino or chlorine and 1, 2 or 3 sulfo groups,

K_3 is a naphthalene ring, which is substituted by one or two sulfonic acid groups as additional substituents, the complex-forming oxygen atoms being bonded to A_1 and K_3 in the ortho-positions each relative to the azo group,

R is hydrogen or alkyl of 1 to 4 C-atoms,

X is β-sulfatoethyl, and

Y is a group of the formula

in which

R^2 is hydrogen, alkyl of from 1 to 4 carbon atoms unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of acetylamino, hydroxy, sulfato, lower alkoxy, sulfo, carboxy, phenyl, naphthyl, phenyl substituted by sulfo, carboxy, methyl, ethyl, methoxy, ethoxy, chlorine, carbamoyl, sulfamoyl or a combination thereof, and naphthyl substituted by chlorine, methyl, methoxy, ethoxy, sulfo, carboxy, or a combination thereof or is cyclohexyl,

R^3 is hydrogen, alkyl of from 1 to 4 carbon atoms unsubstituted or substituted by 1 or 2 substituents selected from the group of acetylamino, hydroxy, sulfato, lower alkoxy, sulfo, carboxy, phenyl, naphthyl, phenyl substituted by sulfo, carboxy, methyl, ethyl, methoxy, ethoxy, chlorine, carbamoyl, sulfamoyl or a combination thereof, and naphthyl substituted by chlorine, methyl, methoxy, ethoxy, sulfo, carboxy or a combination thereof, or R^3 is phenyl or naphthyl, each unsubstituted or substituted by carboxy, sulfo, lower alkyl, lower alkoxy, hydroxy or chlorine, or R^2 and R^3 together with the nitrogen atom form the morpholino, piperidino or piperazino ring radical.

4,649,194

1:2 METAL COMPLEXES OF A DISAZO COMPOUND HAVING A 5-HYDROXY-1-(AMINOPHENYL)PYRAZOLE COUPLING/DIAZO COMPONENT RADICAL AND DISAZO COMPOUND HAVING A 1-AMINO-8-HYDROXYNAPHTHALENE COUPLING/DIAZO COMPONENT

Heinz Wicki, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

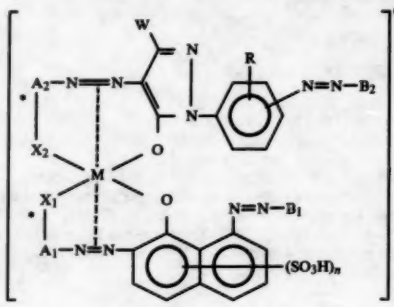
Filed Jul. 27, 1983, Ser. No. 517,766

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1982, 3228071

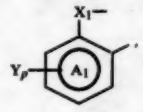
Int. Cl.[4] C09B *45/00, 45/06, 45/26;* **D06P** *3/32*

U.S. Cl. 534—693 **18 Claims**

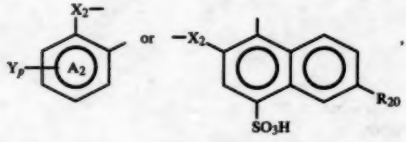
1. A complex of the formula



or a salt thereof, wherein $-A_1-X_1-$ is



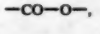
and $-A_2-X_2-$ is



wherein

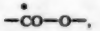
R_{20} is hydrogen or nitro,

X_1 is —O— or



wherein the • indicates the atom attached to A_1, with the proviso that X_1 is ortho to the —N=N— radical attached to A_1,

X_2 is —O— or



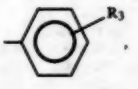
wherein the • indicates the atom attached to A_2, with the proviso that X_2 is ortho to the —N=N— radical attached to A_2,

each Y is independently halo, nitro, carboxy, C_{1-4}alkyl, C_{1-4}alkoxy, sulfo or $-SO_2NR_1R_2$,

wherein

R_1 is hydrogen or C_{1-4}alkyl, and

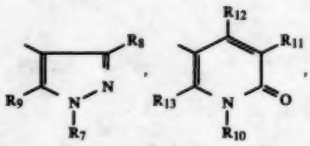
R_2 is hydrogen, C_{1-4}alkyl or

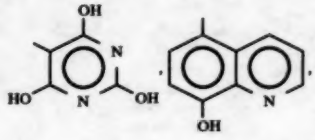


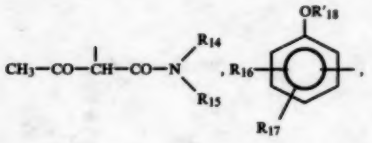
wherein R_3 is hydrogen, halo, C_{1-4}alkyl, C_{1-4}alkoxy, or carboxy, with the proviso that not more than one Y on ring A_1 is a member of the group consisting of sulfo and $-SO_2NR_1R_2$ and not more than one Y on ring A_2 is a member of the group consisting of sulfo and $-SO_2NR_1R_2$, and

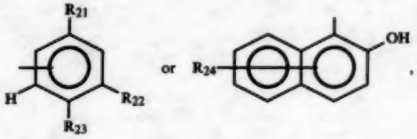
p is 0, 1 or 2,

each of B_1 and B_2 is independently



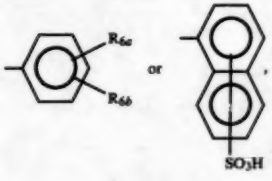






wherein

R_7 is hydrogen,



wherein

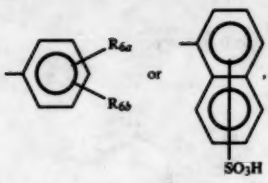
R_{6a} is hydrogen, chloro, methyl, methoxy, cyano, nitro, carboxy, $-SO_2N(R_{7a})_2$ or sulfo, wherein each R_{7a} is independently hydrogen, C_{1-4}alkyl or C_{2-4}alkyl monosubstituted in the 2-, 3- or 4-position by hydroxy or C_{1-4}alkoxy, and

R_{6b} is hydrogen, chloro, methyl, methoxy or carboxy,

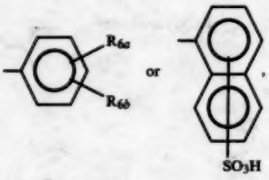
R_8 is C_{1-4}alkyl, phenyl, carboxy or $-CON(R_{7a})_2$, wherein each R_{7a} is independently hydrogen, C_{1-4}alkyl or C_{2-4}alkyl monosubstituted in the 2-, 3- or 4-position by hydroxy or C_{1-4}alkoxy,

R_9 is amino or hydroxy,

R_{10} is hydrogen; amino, phenylamino; C_{1-5}alkyl; C_{2-4}alkyl monosubstituted in the 2-, 3- or 4-position by hydroxy, methoxy, ethoxy, chloro or sulfo; cyclohexyl; cyclohexyl substituted by 1, 2 or 3 C_{1-4}alkyl groups, the total number of carbon atoms in the substituted cyclohexyl group being 7 to 10, inclusive; carboxy(C_{1-4}alkyl);



wherein R_{6a} and R_{6b} are as defined above,
R_{11} is hydrogen, carboxy, sulfo, acetyl or cyano,
R_{12} is hydrogen, hydroxy, methyl, carboxy, phenyl or sulfomethyl,
R_{13} is hydrogen, hydroxy or methyl, with the proviso that at least one of R_{12} and R_{13} is hydroxy,
R_{14} is hydrogen or C_{1-4}alkyl,
R_{15} is C_{1-8}alkyl; cyclohexyl; cyclohexyl substituted by 1, 2 or 3 C_{1-4}alkyl groups, the total number of carbon atoms in the substituted cyclohexyl group being 7 to 10, inclusive;



wherein R_{6a} and R_{6b} are as defined above,
R_{16} is hydrogen, C_{1-4}alkyl, C_{1-4}alkoxy or halo,
R_{17} is hydrogen or C_{1-4}alkyl,
R_{18}' is hydrogen, C_{1-4}alkyl, (C_{1-4}alkyl)carbonyl, benzoyl, phenylsulfonyl or tolylsulfonyl,
R_{21} is amino or hydroxy,
R_{22} is amino or hydroxy,
R_{23} is hydrogen or methyl, with the proviso that R_{23} may be methyl only when R_{21} and R_{22} are both amino, and
R_{24} is hydrogen, 3-carboxy or sulfo,
R is hydrogen or sulfo,
W is methyl or carboxy,
M is iron, cobalt or chromium, and
n is 1 or 2,
wherein each halo is independently fluoro, chloro, bromo or iodo.

4,649,195

PROCESS FOR THE PREPARATION OF METAL DIPHTHALOCYANINES

Christian Clarisse, 7 Avenue de Normandie, 22300 Lannion; Marie-Thérèse Riou née Meston, 8 rue Etienne d'Orves, 22700 Perros Guirec, and Marcel Auregan, 3 rue Charles Colvez, 22300 Lannion, all of France

Filed Jan. 23, 1985, Ser. No. 693,863
Claims priority, application France, Jan. 24, 1984, 84 01164
Int. Cl.[4] C09B *47/067*
U.S. Cl. 540—143 **8 Claims**

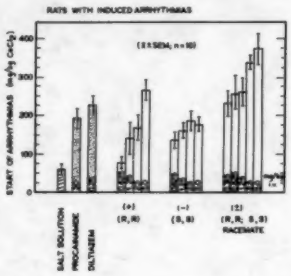
1. Process for the preparation of lanthanide or yttrium diphthalocyanine, in which:
(a) a mixture of pure and dehydrated lanthanide or yttrium derivative and phthalonitrile is heated, the reaction temperature being kept below the critical temperature of endothermicity, then
(b) when an exothermicity appears, the temperature is kept at a temperature below the decomposition temperature of the reactants,
(c) the reaction product is washed with methanol and dimethylformamide, and
(d) the lanthanide or yttrium diphthalocyanine obtained is recovered.

4,649,196

PROCESS FOR THE MANUFACTURE OF RACEMIC (R,R; S,S) ASOCAINOL

Wolfgang Herrmann, Merzhausen, and Gerhard Satzinger, Denzlingen, both of Fed. Rep. of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 3, 1985, Ser. No. 730,124
Claims priority, application Fed. Rep. of Germany, May 23, 1984, 3419099
Int. Cl.[4] C07D *225/08*
U.S. Cl. 540—479 **1 Claim**



1. A process for the preparation of racemic asocainol which comprises:
(a) reacting natural thebaine with phenethyl magnesium bromide;
(b) separating the diastereomers (R,R) and (R,S) by fractional crystallization of the hydrochlorides from a lower alkanol;
(c) heating the diastereomer; (R,S) between 130° and 200° C. in an inert organic solvent or above 138° C. in the absence of a solvent to give partial conversion to the (S,S) enantiomer by thermal rearrangement;
(d) separating by fractional crystallization of the hydrochlorides as in step (b) the (S,S) enantiomer from the (R,S) diastereomer;
(e) dissolving equimolar amounts of the (S,S) and the (R,R) enantiomer of (+)-asocainol as a base or hydrochloride or other pharamcologically acceptable salt in an inert solvent; and
(f) isolating the racemate (R,R; S,S) as its free base or its pharmacologically acceptable acid addition salt.

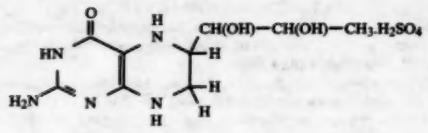
4,649,197

SULFATE OF 5,6,7,8-TETRAHYDRO-L-ERYTHRO-BIOPTERIN AND PROCESS FOR PREPARING THE SAME

Hayashi Uchino, Ako; Masaaki Azuma; Takehisa Ohashi, both of Kobe, and Kiyoshi Watanabe, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki, Osaka, Japan

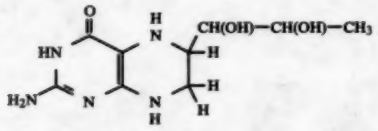
Filed Mar. 18, 1985, Ser. No. 712,813
Claims priority, application Japan, Mar. 24, 1984, 59-56584
Int. Cl.[4] C07D *475/04*
U.S. Cl. 544—258 **10 Claims**

1. A monosulfate of 5,6,7,8-tetrahydro-L-erythrobiopterin having the formula (II):



(II)

4. A process for preparing a monosulfate of a diastereoisomer at the 6-position of 5,6,7,8-tetrahydro-L-erythhro-biopterin having the formula (I):



(I)

which comprises subjecting a mixture of the (6R)-form and the (6S)-form of 5,6,7,8-tetrahydro-L-erythro-biopterin to crystallization from an aqueous medium containing sulfuric acid, and separating from the aqueous medium a crystallized mixture of the (6R)-form and the (6S)-form of the monosulfate of 5,6,7,8-tetrahydro-L-erythro-biopterin, said mixture being enriched in the (6R)-form.

4,649,198

IMIDAZO(1,5-A)PYRIMIDINE DERIVATIVES AND THEIR USE AS ANTIMYCOTIC AGENTS

Tsutomu Irikura, Tokyo; Seigo Suzue, Kuki; Hiroaki Uchida, Tokyo; Hirotaka Shinoda, Kawaguchi; Satoshi Murayama, and Susumu Kinoshita, both of Tochigi, all of Japan, assignors to Kyorin Pharmaceutical Co., Ltd., Tokyo, Japan

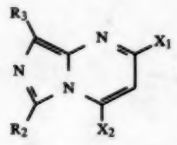
Filed Jul. 10, 1984, Ser. No. 629,385

Claims priority, application Japan, Jul. 12, 1983, 58-126697

Int. Cl.[4] C07D *487/04;* A61K *31/505*

U.S. Cl. 544—281 **1 Claim**

1. A compound selected from the group consisting of a free base and its acid addition salts, said free base having the formula



wherein

each of X_1 and X_2 is chlorine;

R_3 is selected from the group consisting of hydrogen and phenyl;

and R_2 is selected from the group consisting of:

(a) unsubstituted phenyl,

(b) substituted phenyl having up to two substituents selected from the group consisting of an alkyl having 1-4 carbon atoms, methoxy, an alkoxy carbonyl having 1-3 carbon atoms, trifluoromethyl, and a halogen,

(c) an alkyl having 1-2 carbon atoms which is substituted with a phenyl, said phenyl being selected from the group consisting of unsubstituted phenyl and substituted phenyl having up to two halogen substituents,

(d) cinnamyl,

(e) cyclohexyl,

(f) cyclohexylmethyl, and

(g) adamantyl.

4,649,199

SALT OF DC-52 AND A PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Shinzo Ishii, Hofu; Shigeo Katsumata, Mishima; Yukou Arai, Susono; Kazuhisa Fujimoto, and Makoto Morimoto, both of Shizuoka, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

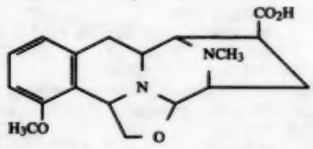
Filed Feb. 4, 1985, Ser. No. 697,918

Claims priority, application Japan, Mar. 16, 1984, 59-51578

Int. Cl.[4] A61K *31/495;* C07D *498/22*

U.S. Cl. 544—342 **4 Claims**

1. A pharmacologically acceptable acid addition salt in a powdery state of a compound represented by the formula:



(hereinafter referred to as DC-52) with 0.5-2.0 equivalent weight of inorganic acid, sulfonic acid, acidic amino acid, citric acid, trans-aconitic acid, α-ketoglutaric acid, itaconic acid, malonic acid or ascorbic acid on the basis of DC-52.

4,649,200

SUBSTITUTED PYRROLES WITH OPIOID RECEPTOR ACTIVITY

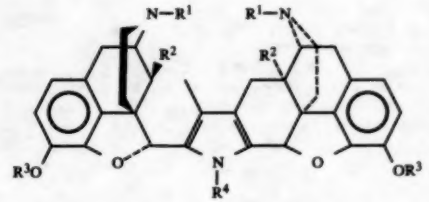
Philip S. Portoghese, Falcon Heights, and Andrzej W. Lipkowski, Minneapolis, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed May 8, 1986, Ser. No. 861,051

Int. Cl.[4] C07D *491/22*

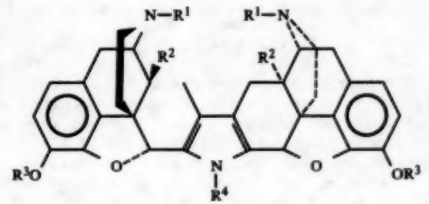
U.S. Cl. 546—26 **12 Claims**

1. A composition of matter comprising a substituted pyrrole of the formula:



wherein R^1 is (C_1-C_5) alkyl, C_3-C_6(cycloalkyl)alkyl, C_5-C_7 (cycloalkenyl)alkyl, aryl, aralkyl, trans-(C_4-C_5)alkenyl, allyl or furan-2-ylalkyl; R^2 is H or OH, R^3 is H, (C_1-C_5) alkyl or (C_1-C_5)alkanoyl and R^4 is H or (C_1-C_5) alkyl; and the pharmaceutically-acceptable salts thereof.

5. A composition of matter comprising a substituted pyrrole of the formula:



wherein R^1 is C_3–C_6(cycloalkyl)alkyl or allyl, R^2 is H or OH, R^4 is H or (C_1–C_5)alkyl and R^3 is H, (C_1–C_5)alkyl or (C_1–C_5)alkanoyl; and the pharmaceutically-acceptable salts thereof.

12. A method for blocking kappa-opioid receptors in mammalian tissue comprising contacting said receptors with an effective amount of the compound of claim 5.

4,649,201

REMOVAL OF FERRIC CHLORIDE FROM HALOPYRIDINES

David D. Friese, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 27, 1985, Ser. No. 813,905
Int. Cl.[4] C07D 211/60; C01G 3/00
U.S. Cl. 546—345 **16 Claims**

1. A process for extracting ferric chloride from mixtures comprising ferric chloride and at least one halopyridine compound of the formula

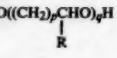
wherein

each X, independently, represents Cl or F,

m represents an integer of 1 to 5, and

n represents an integer of 0 to 2 with the proviso that the sum of m and n is an integer of 2 to 5,

which comprises: admixing the halopyridine as a liquid with an essentially immiscible diol solvent of the formula



wherein

R represents hydrogen or methyl,

p represents an integer of 1 or 2, and

q represents an integer of 1 to 4;

allowing the admixture to separate into halopyridine and diol solvent phases; and, thereafter, removing the diol solvent phase from the halopyridine phase.

4,649,202

BROMINATIVE AROMATIZATION OF 4-CYCLOHEXENYLPYRIDINES

Paul F. Ranken, and Venkataraman Ramachandran, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 511,831, Jul. 8, 1983, abandoned, and a continuation-in-part of Ser. No. 511,832, Jul. 8, 1983, abandoned, and a continuation-in-part of Ser. No. 511,913, Jul. 8, 1983, abandoned. This application Mar. 22, 1985, Ser. No. 715,005
Int. Cl.[4] C07D 213/26, 213/06
U.S. Cl. 546—348 **12 Claims**

1. A process which comprises reacting a 4-cyclohexenylpyridine reactant selected from 4-cyclohexenylpyridines and hydrohalide salts thereof with 1 to 5 molar equivalents of a brominating agent at a temperature of 20°–70° C. wherein bromine adds to the double bond of the cyclohexene ring and heating the resultant brominated product at a temperature of about 80°–300° C. forming the corresponding 4-phenylpyridine.

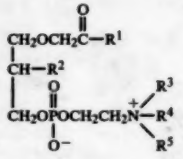
4,649,203

KETOALKYLPHOSPHOLIPIDS

Shoshichi Nojima, Tokyo; Hiroaki Nomura, and Susumu Tsushima, both of Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 659,928, Oct. 11, 1984, abandoned. This application Mar. 27, 1986, Ser. No. 843,811
Claims priority, application Japan, Oct. 11, 1983, 58-190349
Int. Cl.[4] C07F 9/10, 9/65
U.S. Cl. 548—112 **16 Claims**

1. A compound of the formula



wherein

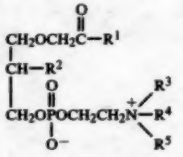
R^1 is an aliphatic hydrocarbon residue containing 10 to 20 carbon atoms selected from the group consisting of C_{10-20} alkyl, C_{10-20} alkenyl and C_{10-20} alkynyl groups, said groups being unsubstituted or substituted by up to two substituents selected from the group consisting of hydroxy, mercapto, amino, oxo, carbamoyl, halogen, C_{3-7} cycloalkyl and phenyl,

R^2 is hydrogen or methoxy, and

R^3, R^4 and R^5 are independently hydrogen or C_{1-5} alkyl,

or a pharmaceutically acceptable salt thereof.

2. A compound of the formula



wherein

R^1 is an aliphatic hydrocarbon residue containing 10 to 20 carbon atoms selected from the group consisting of C_{10-20} alkyl, C_{10-20} alkenyl and C_{10-20} alkynyl groups, said groups being unsubstituted or substituted by up to two substituents selected from the group consisting of hydroxy, mercapto, amino, oxo, carbamoyl, halogen, C_{3-7}cycloalkyl and phenyl,

R^2 is hydrogen or methoxy, and

represents a cyclic ammonio group,

or a pharmaceutically acceptable salt thereof.

4,649,204

DIALKANOLAMINE DERIVATIVES

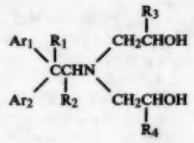
Bruce E. Maryanoff, New Hope, Pa., assignor to McNeilab, Inc., Fort Washington, N.J.

Continuation of Ser. No. 497,338, May 23, 1983, abandoned, which is a continuation-in-part of Ser. No. 298,962, Sep. 3, 1981, abandoned. This application Sep. 30, 1985, Ser. No. 782,148

Int. Cl.[4] C07C 87/28; C07D 207/00

U.S. Cl. 548—541 11 Claims

1. A compound selected from the group consisting of dialkanolamines of the formula:



and nontoxic, pharmaceutically acceptable acid addition salts thereof, wherein R_1 is hydrogen, lower alkyl, or fluoro; R_2 is hydrogen or lower alkyl; R_3 and R_4 are the same or different and selected from the group consisting of hydrogen or lower alkyl or R_3 and R_4 taken together define a chemical bond directly linking the two alkanol chains so as to form a pyrrolidine ring; Ar_1 is phenyl; and Ar_2 is phenyl.

4,649,205

PROCESS FOR THE MANUFACTURE OF MALEIC ANHYDRIDE UTILIZING CATALYSTS REACTIVATED WITH ALKYL ESTERS OF ORTHOPHOSPHORIC ACID IN THE PRESENCE OF WATER

Robert C. Edwards, Naperville, and Carl A. Udovich, Joliet, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 484,949, Apr. 14, 1980, abandoned. This application Feb. 27, 1985, Ser. No. 706,034

Int. Cl.[4] C07D 307/60

U.S. Cl. 549—260 12 Claims

1. A continuous process for the vapor-phase oxidation of butane feedstock to form maleic anhydride in which butane is contacted in the presence of molecular oxygen or air at an hourly space velocity about 1000 to 4000 cubic centimeters of feed per cubic centimeter of catalyst per hour with a vanadium-phosphorus-oxygen catalyst promoted by zinc or molybdenum wherein the catalyst is regenerated continuously by contacting it during the vapor-phase oxidation with water and an alkyl ester of orthophosphoric acid having the formula $(RO)_3P{=}O$ where R is hydrogen or a C_1 to C_4 alkyl, at least one R being a C_1 to C_4 alkyl, wherein the amount of water added is about 1000 parts per million to about 40,000 parts per million by weight of the reactor feed gas stream and the amount of the alkyl ester added is about 0.1 parts per million to about 100,000 parts per million by weight of the reactor feed gas stream.

4,649,206

LIGNAN COMPOUND

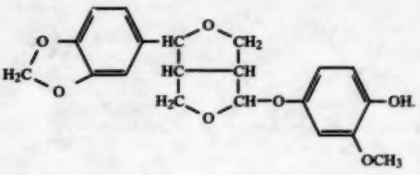
Mitsuo Namiki, Nagoya; Toshihiko Osawa, Chiyodabashi; Yasuko Fukuda, Nagoya, and Tatsuhiko Ozaki, Nishio, all of Japan, assignors to Takemoto Yushi Kabushiki Kaisha, Aichi, Japan

Filed Sep. 3, 1985, Ser. No. 771,982

Int. Cl.[4] C07D 407/00

U.S. Cl. 549—435 2 Claims

1. A lignan compound shown by the formula



4,649,207

DERIVATIVES OF DIPHENYLHEXAFLUOROPROPANE

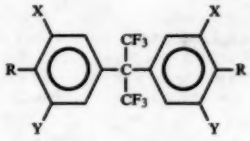
Kreisler S. Y. Lau, Alhambra, and William J. Kelleghan, Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 646,999, Sep. 4, 1984, abandoned. This application May 13, 1986, Ser. No. 862,742

Int. Cl.[4] C07C 63/33, 49/76, 47/52, 25/18

U.S. Cl. 549—563 6 Claims

1. A diphenylhexafluoropropane compound having the formula:



where R is an unsubstituted, or substituted alkylene, an epoxy, a silyl or alkoxysilyl group; and where X and Y are hydrogen or a halogen.

4,649,208

PROCESS FOR MAKING AMINO GROUP-CONTAINING ORGANOSILICON COMPOUNDS

Michio Zenbayashi, and Noria Sato, both of Ohta, Japan, assignors to Toshiba Silicone Co., Ltd., Japan

Filed Dec. 20, 1985, Ser. No. 811,606

Claims priority, application Japan, Mar. 8, 1985, 60-46106

Int. Cl.[4] C07F 7/08, 7/10, 7/18

U.S. Cl. 556—413 6 Claims

1. A process for making an organosilicon compound containing an amino group, which comprises reacting an allylamine with the hydrosilyl group of a silicon compound represented by the formula:

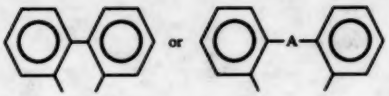
$$H(R^1)_nSi(OR^2)_{3-n}$$

wherein R^1 represents monovalent groups which may be identical or different and are selected from the group consisting of substituted or unsubstituted hydrocarbon groups, di- or trimethylsilyl groups and mono- or polyorganosiloxanyl groups; R^2 represents an alkoxy-substituted or unsubstituted alkyl group; and n represents an integer of 0 to 3,

in the presence of a complex of platinum with an olefin or its derivative, said reaction being carried out further in the presence of an amino compound represented by the formula:

$$N(R^3)_3 \text{ or } HNQ$$

wherein R^3 represents monovalent groups which may be identical or different and are selected from the group consisting of hydrogen, alkyl groups and phenyl groups, at least one of which is an alkyl group or a phenyl group; Q represents a divalent group of the formula:



of which two valences are bonded to the same N atom; and A represents O or S.

4,649,209

PROCESS FOR PREPARING METHYL CHLOROSULFATES

Emil J. Geering, Grand Island, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Aug. 5, 1985, Ser. No. 762,178
Int. Cl.[4] C07C *143/68*
U.S. Cl. 558—46 8 Claims

1. A process for preparing at least one methyl chlorosulfate comprises the steps of:

(a) reacting methylene chloride with sulfur trioxide,

(b) adding a stabilizing agent selected from the group consisting of sodium carbonate, sodium bicarbonate, and mixtures thereof to the reaction mixture,

(c) distilling the stabilized reaction mixture, and

(d) recovering at least one methyl chlorosulfate selected from the group consisting of chloromethyl chlorosulfate and methylene bis(chlorosulfate) as a distillate.

4,649,210

REDUCING PHOSGENATION REACTION TEMPERATURES

Philip G. Kosky, Schenectady; James M. Silva, Clifton Park; Daniel J. Brunelle, Scotia, and Thomas G. Shannon, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 23, 1985, Ser. No. 778,820
Int. Cl.[4] C07C *68/02, 69/96*
U.S. Cl. 558—265 11 Claims

1. A method for performing phosgenation reactions at reduced reflux temperatures which comprises introducing an inert fluorocarbon refrigerant to a phosgenation reaction medium comprising a methylene chloride solvent system and a hydroxy compound of the formula $R^2(OH)_x$, wherein R^2 is an aliphatic, alicyclic or aromatic radical and x is at least 1; and then reacting phosgene within said reaction medium at reflux, at a temperature below about 30° C. and a pressure of about 1 atmosphere, said inert fluorocarbon refrigerant being selected from the group consisting of $CHCl_2F$, CCl_3F, $CClF_2$—$CClF_2$, CCl_2—F—CF_3, CH_2Cl—CF_3, CH_3—ClF_2, $CBrClF_2$, CF_2I—CF_3, CHClF—$CClF_2$, perfluorinated carbon compounds of from 4 to 5 carbon atoms and fluorinated ethers of from 2 to 4 carbon atoms.

2. A method as in claim 1 for producing bischloroformate wherein the perfluorinated carbon compounds are selected from the group consisting of n-perfluorobutane, perfluoroisobutane and cyclicoctafluorobutane; and the fluorinated ethers are selected from the group consisting of tetrafluorodimethyl ether, monofluorodimethyl ether, perfluorodiethyl ether, and 1,1-difluorodimethyl ether.

4,649,211

PROCESS FOR THE PREPARATION OF 2-CYANOMETHYLCYCLOHEXANONE

Anna M. C. F. Castelijns, and Thomas M. G. Aarts, both of Stein (L.), Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Sep. 12, 1984, Ser. No. 649,653
Claims priority, application Netherlands, Sep. 16, 1983, 8303206
Int. Cl.[4] C07C *120/00, 121/46*
U.S. Cl. 558—430 8 Claims

1. A process for the preparation of 2-cyanomethylcyclohexanone which consists essentially of:

forming the strong acid salt of the Mannich base of cyclohexanone by reaction of cyclohexanone with formaldehyde and the strong acid salt of a secondary amine of the general formula HNR_1R_2 wherein R_1 and R_2 independently represent a C_1–C_3 alkyl group or together represent —$(CH_2)_n$— wherein n=4 or 5,

converting said Mannich base acid salt directly to the corresponding cyanohydrin by reaction with sodium or potassium cyanide,

dissolving the thus-obtained cyanohydrin in a polar, aprotic solvent having a boiling point of at least 140° C. to obtain a solution containing 5–60 wt % cyanohydrin, and

pyrolysing the cyanohydrin, without additional water being added, at a temperature of from 100° C. to 170° C.

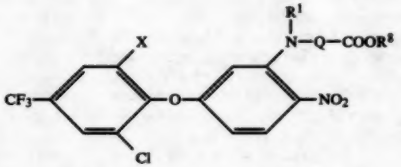
4,649,212

NOVEL PHENOXYPHENYLAMINO ACID DERIVATIVES, THE PRODUCTION THEREOF, COMPOSITIONS CONTAINING THEM AND USE THEREOF

Dieter Dürr, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 401,584, Jul. 26, 1982, abandoned. This application Apr. 4, 1985, Ser. No. 719,632
Claims priority, application Switzerland, Jul. 8, 1981, 5099/81; Jun. 7, 1982, 3504/82
Int. Cl.[4] C07C *79/46*
U.S. Cl. 560—21 35 Claims

1. A compound selected from the group consisting of an aminoalkanoic acid derivative of the formula:



wherein

X is hydrogen, chloro, fluoro or bromo;

R^1 is hydrogen, nitroso, or an unsubstituted or halo substituted alkyl, alkenyl, alkanoyl or alkenoyl group of up to 4 carbon atoms;

Q is straight or branched chained alkylene of 1 to 5 carbon atoms or alkenylene of 2 to 5 carbon atoms which is unsubstituted or substituted with hydroxy, alkylthio of 1 to 4 carbon atoms, carboxy or carbalkoxy in which alkoxy contains 1 to 4 carbon atoms; and

R^8 is hydrogen, alkyl of 1 to 8 carbon atoms, alkyl of 1 to 8 carbon atoms which is unsubstituted or substituted with halo or alkoxy of 1 to 4 carbon atoms, alkenyl of 2 to 8 carbon atoms, or alkynyl of 3 to 8 carbon atoms; and

the alkali metal, alkaline earth metal, and amine salts thereof when R^8 is hydrogen.

4,649,213

PROCESS FOR PRODUCING AN α-AROMATIC GROUP SUBSTITUTED ALKANOIC ACID DERIVATIVE

Takayoshi Yamauchi; Kaneaki Hattori; Shun-ichi Ikeda; Kenji Nakao, and Kentaro Tamaki, all of Sakai, Japan, assignors to Kyowa Hakko Kogyo Co. Ltd., Tokyo, Japan

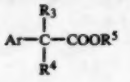
Filed Apr. 12, 1985, Ser. No. 722,833

Claims priority, application Japan, Apr. 14, 1984, 59-75551; Oct. 23, 1984, 59-222845

Int. Cl.[4] C07C 69/76

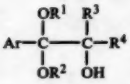
U.S. Cl. 560—56 3 Claims

1. A process for producing an α-aromatic group substituted alkanoic acid derivative represented by formula IV



IV

wherein Ar represents a substituted or unsubstituted aryl group having 6 to 12 carbon atoms or a heterocyclic group, R^3 and R^4 are the same or different groups and each represents a hydrogen atom or an alkyl group having 1 to 5 carbon atoms and R^5 represents a hydrogen atom or a substituted or unsubstituted alkyl group having 1 to 5 carbon atoms, wherein said process comprises subjecting a compound represented by formula I



I

wherein R^1 and R^2 are the same or different groups and represent an alkyl group having 1 to 5 carbon atoms or form a cyclic acetal of a single compound and Ar, R^3 and R^4 have the same significance as in formula IV, to rearrangement in the presence of

(A) a base or an amide, and

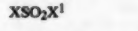
(B)

(1) a compound represented by formula II

II

wherein X and X^1 are the same or different groups and each represents a halogen atom or a trifluoromethyl group,

(2) a compound represented by formula III



III

wherein X and X^1 represent a halogen atom, or

(3) sulfur dioxide and halogen.

4,649,214

5(6)-HYDROXYMETHYL-NORBORNANE-2-CARBOXYLIC ACID ESTERS AND POLYURETHANES PREPARED THEREFROM

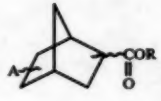
Elizabeth J. Gladfelter, St. Paul, and Edgar R. Rogier, Minnetonka, both of Minn., assignors to Henkel Corporation, Minneapolis, Minn.

Filed Nov. 30, 1984, Ser. No. 676,705

Int. Cl.[4] C07C 69/757, 69/753

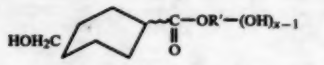
U.S. Cl. 560—120 5 Claims

1. A norbornane-2-carboxylic acid ester of the formula:



wherein A is CHO and R is selected from alkyl of 1–6 carbon atoms, phenyl, or benzyl.

3. A 5(6)-hydroxymethyl-norbornane-2-carboxylic acid polyol ester of the formula:



wherein R' is the residue of a polyol and x is an integer of 2 to 6.

4,649,215

ALIPHATIC THIOETHERS

Andreas von Sprecher, Oberwil; Ivan Ernest, Birsfelden, both of Switzerland; Alan J. Main, Chatham Township, Morris County, N.J., and Andreas Beck, Freiburg, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

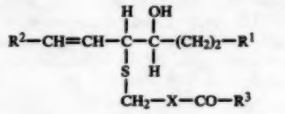
Filed Jun. 25, 1985, Ser. No. 748,656

Claims priority, application Switzerland, Jun. 28, 1984, 3115/84; Feb. 12, 1985, 617/85

Int. Cl.[4] C07C 149/20, 147/02

U.S. Cl. 560—152 36 Claims

1. A compound of the formula

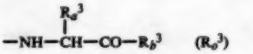


(I)

in which R^1 represents a C_{1-3}-alkyl radical or a C_{1-3}-alkyl radical or C_{1-3}-hydroalkyl which is free or esterified with a C_1–C_{12} alkanoic acid,

R_2 represents a saturate or unsaturated aliphatic radical having from 5 to 15 carbon atoms,

R_3 represents hydroxy, C_1–C_7 alkoxy, an unsubstituted amino group or a substituted amino group of the formula



(R_6^3)

in which R_b^3 represents hydrogen or a C_{1-5}-alkyl radical and R_b^3 represents hydroxy, C_{1-7}-alkoxy or a primary amino group,

—X— represents a single bond, a methylene group, a aminomethylene group or a primary aminomethylene which has been acylated with a C_1–C_{12} carboxylic acid

wherein the O-atom of the hydroxy group is in the trans-configuration relative to the S-atom, or a salt of such compound having a salt-forming property.

4,649,216

CARBONYLATION PROCESS FOR THE PRODUCTION OF AROMATIC ACIDS

Mark Rule; Thomas H. Larkins, Jr.; Donald W. Lane, and Guy R. Steinmetz, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 759,787, Jul. 29, 1985, abandoned. This application Jul. 25, 1986, Ser. No. 889,458

Int. Cl.[4] C07C 67/36

U.S. Cl. 562—406 3 Claims

1. A process for the preparation of aromatic carboxylic acids which comprises reacting an aromatic iodide having 5 to 14 atoms with carbon monoxide in the presence of a nickel catalyst in a carboxylic acid reaction medium which contains about 1 to 15 weight percent of an alkyl acetate.

4,649,217

PROCESS FOR PRODUCING OXOCARBOXYLIC ACIDS

Takao Maki, Fujisawa; Kenji Murayama, Yokohama, and Yoshio Asahi, Sagamihara, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Mar. 15, 1983, Ser. No. 475,646

Claims priority, application Japan, Apr. 2, 1982, 57-53908; May 24, 1982, 57-87607; Jul. 21, 1982, 57-127054; Sep. 2, 1982, 57-153069

Int. Cl.[4] C07C *51/31, 59/147, 59/185*

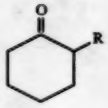
U.S. Cl. 562—528 21 Claims

1. A process for the synthesis of an oxocarboxylic acid of the formula (II):

$$RCO(CH_2)_4COOH \quad (II)$$

which comprises:

oxidizing a cyclohexanone of the formula (I):



wherein R in both formulas has the same meaning and is hydrogen or alkyl, with molecular oxygen in the presence of (a) from 0.05 to 1000 parts by weight water, based on one part by weight cyclohexanone, and (b) an iron or iridium compound being soluble in the reaction system, said oxidation occurring at a temperature of from 0° to 200° C.

4,649,218

LIPOPHILIC LITHIUM IONOPHORES

Abraham Shanzer, Bat Yam, and David Samuel, Rehovot, both of Israel, assignors to Yeda Research and Development Company Ltd., Rehovot, Israel

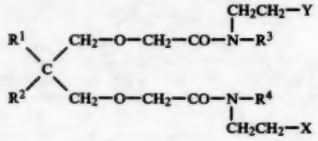
Filed Jan. 14, 1981, Ser. No. 225,043

Claims priority, application Israel, Jan. 17, 1980, 59148

Int. Cl.[4] C07C *103/38*

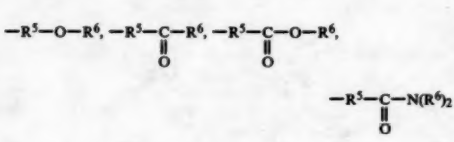
U.S. Cl. 564—197 4 Claims

1. A lithium ionophore of the formula



wherein

X and Y, which may be identical or different, are each a group selected from:



wherein

R^1 and R^2 are alkyl groups of 1 to 3 carbon atoms,

R^3, R^4, R^5 and R^6 are alkyl groups of 1 to 12 carbon atoms,

wherein

R^6 can also be hydrogen,

wherein

R^3 and R^4 can be interlinked to form a group, $—R^3—R^4—$ and wherein

R^5 may also be a bond.

4,649,219

UNSATURATED CYCLIC AMIDO-SUBSTITUTED ETHER COMPOUNDS AND PREPARATION PROCESS THEREOF

Hiroshi Itoh; Atsuhiko Nitta, both of Yokohama; Tomio Tanaka, Tokyo, and Hideo Kamio, Odawara, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

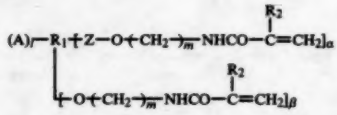
Filed Mar. 6, 1985, Ser. No. 708,568

Claims priority, application Japan, Mar. 13, 1984, 59-46532

Int. Cl.[4] C07C *103/38*

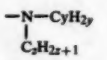
U.S. Cl. 564—207 4 Claims

1. Unsaturated cyclic amido-substituted ether compound represented by the following general formula (I):



(I)

wherein: R_1 is an aromatic ring; Z is an alkylene group having 1 or 2 carbon atoms, an alkenylene group having 3 carbon atoms, an oxyalkylene group represented by the general formula $—O—C_xH_{2x}—$, wherein x is an integer of 1 or 2, or an aminoalkylene group represented by the general formula:



wherein y and z are each an integer of 2; A is a halogen atom, a hydroxyl group, an oxo group, a cyano group, a nitro group, a mercapto group, a sulfo group, an alkyl group having 1 to 9 carbon atoms, an alkenyl group having 3 carbon atoms, an aminoalkyl group represented by the general formula:

wherein R′ and R″ each are an alkyl group having 1 or 2 carbon atoms, or a group represented by the general formula RO— or RCO—, wherein R is an alkyl group having 1 carbon atom or an aryl group; R_2 is a hydrogen atom or a methyl group; l is an integer of 0 to 3; m is an integer of 4 to 20; α and β each stand for an integer of 0 or 1, with the proviso that $\alpha+\beta=1$.

4,649,220

METHOD FOR PERFORMING ORGANIC REACTIONS IN SILICONE OILS

Hans P. Suerken, Zaltbommel, Netherlands; Jürgen Amort, Troisdorf-Sieglar; Horst Hanisch, Hennef, both of Fed. Rep. of Germany, and Hendrikus van der Maas, Zuilichem, Netherlands, assignors to Dynamit Nobel AG, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 561,164, Dec. 14, 1983, abandoned. This application Jul. 26, 1985, Ser. No. 759,920

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3247994; Mar. 8, 1983, 3308089

Int. Cl.[4] C07B *43/04;* C07C *85/04*

U.S. Cl. 564—296 5 Claims

1. A process for the performance of reactions between alkyl halides and tertiary amines wherein the reaction is carried out in a silicone oil, the viscosity of which is from 40 to 20,000 centistokes at 25° C.

4,649,221

POLYHYDROXYLAMINES

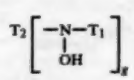
Ramanathan Ravichandran, Yonkers, N.Y.; Roger F. Malherbe, Basel, Switzerland, and Raymond Seltzer, New City, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 633,549, Jul. 23, 1984, which is a continuation-in-part of Ser. No. 540,732, Oct. 11, 1983, abandoned. This application Mar. 21, 1985, Ser. No. 714,649

Int. Cl.[4] C07C *83/102*

U.S. Cl. 564—300 **12 Claims**

1. A compound of formula I



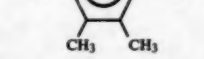
wherein

T_1 is hydrogen, alkyl of 1 to 36 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, aralkyl of 7 to 9 carbon atoms, or said aralkyl substituted by alkyl of 1 to 36 carbon atoms or by one or two halogen atoms,

g is 2, 3 or 4,

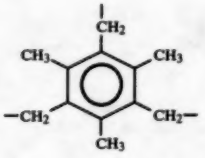
when g is 2,

T_2 is alkylene of 2 to 12 carbon atoms, cycloalkylene of 6 to 10 carbon atoms, arylene of 6 to 10 carbon atoms, alkylenearylenealkylene of 8 to 10 carbon atoms, or



when g is 3,

T_2 is alkanetriyl of 3 to 6 carbon atoms, or



or when g is 4,

T_2 is alkanetetrayl of 4 to 6 carbon atoms, with the proviso that, when T_1 is hydrogen and g is 2, T_2 is not alkylene of 2 to 12 carbon atoms.

4,649,222

2-(SUBSTITUTED AMINO)-2-[2-HYDROXY-2-ALKYL (OR PHENYL)ETHYL]TRICYCLO[3.3.1.1^{3,7}]DECANE HYDROHALIDES

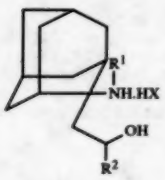
Vassil S. Georgiev, Rochester; George B. Mullen, Avon, and Patricia A. Swift, Rochester, all of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 22, 1986, Ser. No. 821,298

Int. Cl.[4] C07C *87/47*

U.S. Cl. 564—459 **10 Claims**

1. A compound having the formula:



Where R^1 is lower alkyl,

Where R^2 is branched or unbranched alkyl containing 1 to 18 carbons, phenyl, or phenyl which is mono- or disubstituted with lower alkyl, lower alkoxy, halogen, nitro and combinations thereof, and

Where X is Cl, Br, or I.

4,649,223

CATALYSTS AND PROCESS FOR THE CONVERSION OF OLEFINS TO KETONES

Chuen Y. Yeh, Edison, and Charles Savini, Warren, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 516,902, Jul. 25, 1983, Pat. No. 4,560,805, which is a continuation-in-part of Ser. No. 420,527, Sep. 21, 1982, abandoned. This application Sep. 16, 1985, Ser. No. 776,790

Int. Cl.[4] C07C *45/00*

U.S. Cl. 568—403 **7 Claims**

1. A process for preparing ketones in high selectivity which comprises passing a secondary aliphatic alcohol in the gaseous phase with water vapor as feeds to a reaction zone containing a catalyst selected from the group consisting of compound or complex rhenium sulfides at a pressure of from about 0 to 2000 psig and employing an alcohol:water molar ratio of from about 0.01 to 100:1 to form the ketone corresponding to said alcohol.

4,649,224

POLYETHERS MODIFIED WITH ALPHA OLEFIN OXIDES

Edward J. Panek, Durham, N.C., and Paula Davis, Gibraltar, Mich., assignors to BASF Corporation, Wyandotte, Mich.

Division of Ser. No. 615,613, May 31, 1984, which is a continuation of Ser. No. 249,880, Apr. 1, 1981, abandoned, which is a continuation-in-part of Ser. No. 86,840, Oct. 22, 1979, abandoned. This application May 2, 1986, Ser. No. 858,712

Int. Cl.[4] C07C *43/11, 43/10*; B01J *13/00*

U.S. Cl. 568—624 **4 Claims**

1. The polyether thickener for aqueous systems comprising a polyether having a molecular weight of about 1000 to about 75,000 prepared by reacting ethylene oxide and at least one lower alkylene oxide having 3 to 4 carbon atoms with at least one active hydrogen-containing aliphatic compound wherein said aliphatic compound is a polyhydric alcohol having from 2 to 10 carbon atoms and from 2 to 6 hydroxyl groups, to prepare a block copolymer and further reacting said copolymer with at least one a-olefin oxide having a carbon chain length of about 12 to about 18 aliphatic carbon atom and wherein said a-olefin oxide is present in the amount of about 1 percent to about 20 percent by weight, based upon the total weight of said thickener.

4,649,225

HYDROGENOLYSIS OF POLYALKYLENE GLYCOLS TO PRODUCE MONOETHYLENE GLYCOL MONOALKYL ETHERS, MONOETHYLENE GLYCOL AND ETHANOL

William J. Bartley, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 307,224, Sep. 30, 1981, abandoned. This application May 21, 1985, Ser. No. 736,528

Int. Cl.[4] C07C 41/01, 27/00

U.S. Cl. 568—678 10 Claims

1. A process for making monoethylene glycol monoethyl ether from polyethylene glycol comprising providing said polyethylene glycol with molecular hydrogen under hydrogenolysis conditions including elevated temperature and the presence of hydrogenation catalyst comprising iridium, sufficient to cleave said polyethylene glycol at a carbon-to-oxygen terminal hydroxy bond.

4,649,226

HYDROGENATION OF ALKYL OXALATES

Fedor Poppelsdorf, Charleston, W. Va., and Charles A. Smith, Myrtle Beach, S.C., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 27, 1986, Ser. No. 844,559

Int. Cl.[4] C07C 29/136, 31/20

U.S. Cl. 568—864 6 Claims

1. A process for the hydrogenation of alkyl oxalates to ethylene glycol in a tubular reactor and in the presence of a bed of hydrogenation catalyst packed in a tubular column, which comprises effecting said hydrogenation reaction under hydrogenation conditions in the presence of the improved calcined hydrogenation catalyst shape having an annular configuration with an open center core, and wherein said shape contains, as a reinforcing matrix distributed therein, from about 10 to about 60 weight percent, based on the total weight of said catalyst shape, of fibers having a regular distribution of lengths of from about 0.04 mm to about 2.0 mm, and an average diameter of from about 0.005 mm to about 0.03 mm, said annular catalyst shape having overall dimensions of up to about 10 mm in width, from about 2.3 mm up to about 10 mm in thickness, a wall thickness as measured from the core to the outer circumference of said annular shape of as low as 1.3 mm, and a minimum crush strength of at least about 4 pounds as applied perpendicularly to the axis of the annulus.

4,649,227

PHOTOACTIVE PYRITE LAYER AND PROCESS FOR MAKING AND USING SAME

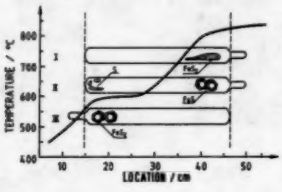
Helmut Tributsch, Alsenstr. 24, D-1000 Berlin 39; Ahmed Ennaoui, Kantstr. 26, D 1000 Berlin 12; Wolfram Jaegermann, Ruhlaer Str. 9, D 1000 Berlin 33, and Sebastian Fiechter, Gartenstr. 4 a, D 1000 Berlin 37, all of Fed. Rep. of Germany

Filed Jul. 24, 1985, Ser. No. 758,508

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1984, 3428268

Int. Cl.[4] H01L *31/04;* H01M *6/16*

U.S. Cl. 136—252 16 Claims



14. A method of using as a solar cell electrode in a circuit, a photoactive structure comprising a body of pyrite material having the formula $FeS_{2\pm x}$, wherein x is ≤ 0.05, a doping of from 10^{16} to 10^{19} per cm^3 selected from the group consisting of manganese, arsenic, cobalt, and chloride, and a concentration of other impurities of less than 10^{20} per cm^3, the method comprising subjecting the body of pyrite material in the form of a solar cell electrode in a circuit to illumunation by light to convert the light to electrical energy in the circuit.

4,649,228

TRANSMISSION LINE

Hirosuke Suzuki, Tokorozawa, Japan, assignor to Junkosha Co., Ltd., Japan

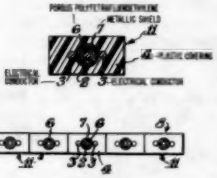
Filed Apr. 15, 1985, Ser. No. 723,327

Claims priority, application Japan, Apr. 18, 1984, 59-55978[U]

The portion of the term of this patent subsequent to Feb. 24, 2004, has been disclaimed.

Int. Cl.[4] H01B *7/34*

U.S. Cl. 174—36 4 Claims



1. An electrical transmission line comprising at least one elongated signal conductor and one or more other elongated conductors placed away from and in substantially parallel relationship to said signal conductor, all conductors being encased in an outer insulating resin covering having a rectangular cross-section, the signal conductor being further encased within an inner insulating porous resin covering, the porous resin covering having an electrical shielding layer thereover wherein said inner insulating porous resin covering is expanded, porous polytetrafluoroethylene and wherein at least one of said other conductors is bonded to said shielding layer and wherein said porous resin has, in addition to the pores in the resin, a large number of through holes.

3. A multiple component transmission line in the form of a flat cable having a plurality of transmission lines joined together in side-by-side relationship wherein each said transmission line comprises at least one elongated signal conductor and one or more other elongated conductors placed away from and in substantially parallel relationship to said signal conductor, all conductors being encased in an outer insulating resin covering having a rectangular cross-section, the signal conductor being further encased within an inner insulating porous resin covering, the porous resin covering having an electrical shielding layer thereover wherein said inner insulating porous resin covering is expanded porous polytetrafluoroethylene and wherein at least one of said other conductors is bonded to said shielding layer, and wherein said porous resin has, in addition to the pores in the resin, a large number of through holes.

4,649,229

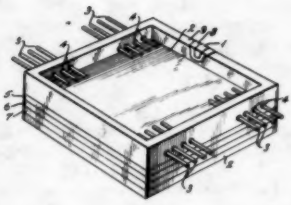
ALL METAL FLAT PACKAGE FOR MICROCIRCUITRY

Jeremy D. Scherer, and Steven A. Tower, both of Dartmouth, Mass., assignors to Aegis, Inc., New Bedford, Mass.

Filed Aug. 12, 1985, Ser. No. 764,567

Int. Cl.[4] H05K *5/04*

U.S. Cl. 174—52 FP 7 Claims



1. A flat package for electric microcircuits comprising:

(a) a frame consisting of an iron-nickel-cobalt alloy having electrical leads extending therethrough, said leads being glass-sealed therein;

(b) a molybdenum bottom, said molybdenum bottom having successive copper, nickel and gold plated layers thereon, said plated layers at least in the area of contact with said frame;

(c) said frame forming the side walls of the package and being brazed to said molybdenum bottom to form a continuous seal between said frame and said bottom; and

(d) said brazing having been accomplished after said leads are glass-sealed in said frame and said brazing effected at a temperature below about 400° C.

4,649,230

ELECTRICAL UNIVERSAL CONNECTING BOX

Alf Nielsen, No. 1 Torvelodsvej, DK 3360 Liseleje, Denmark

PCT No. PCT/DK84/00084, § 371 Date May 17, 1985, § 102(e) Date May 17, 1985, PCT Pub. No. WO85/01396, PCT Pub. Date Mar. 28, 1985

PCT Filed Sep. 10, 1984, Ser. No. 740,270

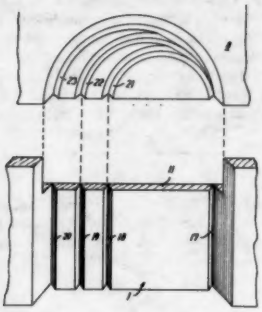
Claims priority, application Denmark, Sep. 23, 1983, 4364/83

Int. Cl.[4] H02G *3/08*

U.S. Cl. 174—65 R 8 Claims

1. An electrical connecting box for low voltage installations comprising a lower part (1) having a bottom (2) to be arranged against a fixed support and an upper part (8) adapted for securing to the lower part (1), said upper part having side walls (9–12) in at least one of which a number of punch-out blank portions for providing openings for electrical insulation tubes, wires and/or cables are defined by a set of punch lines (21–23), one of which forms a common border for the blank portions at one side thereof, characterized in that the lower part (1) has upright side walls (4–7) on all sides, said side walls having a circumferential shoulder part (11) forming an abutment for edges of the side walls (9–12) of the upper part (8), each set of punch lines comprising in the side walls (9–12) of the upper part (8) a number of punch lines formed substantially as circu-

lar arcs and extending to said edges, each of these set of punch lines having a corresponding set of punch lines (16) in the



adjoining side wall of the lower part, said latter punch lines (17–20) being parallel straight lines at right angles to the bottom (2) of the lower part (1).

4,649,231

METHOD FOR THE TRANSMISSION OF CHARACTERS BY MEANS OF THE CODE COMBINATIONS OF A TELEGRAPH ALPHABET

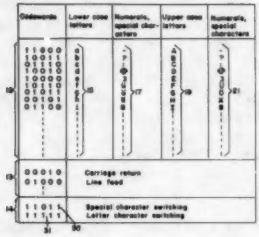
Hans Marbet, Mattstetten, Switzerland, assignor to Hasler AG Bern, Bern, Switzerland

Filed Feb. 5, 1985, Ser. No. 698,245

Claims priority, application Switzerland, Feb. 10, 1984, 649/84

Int. Cl.[4] H04L *17/00, 15/00*

U.S. Cl. 178—2 B **13 Claims**



1. A method for the transmission of characters by means of the code combinations of a telegraph alphabet, particularly of the International Telegraph Alphabet No. 2,

where the characters are coordinated in a single or multiple way to code combinations (12), such that a complete set of code combinations (12, 13, 14) corresponds at least to a set of small letters (15), to a set of capital letters (19) and to a set of digits, punctuation marks and special characters (17),

where a coordination of the character code combinations (12) to the sets of characters (15, 17, 19) is based in each case on the choice of previously transmitted shift code combinations (30, 31), comprising,

that the coordination of the code combinations (12) to the set of capital letters (19) is achieved in two ways, depending on whether singles or sequences of characters of this set (19) shall be transmitted, and where the sequences may be interjected by characters of the set of digits, punctuation marks and special characters (17) and/or control characters (e.g. Carriage return).

4,649,232

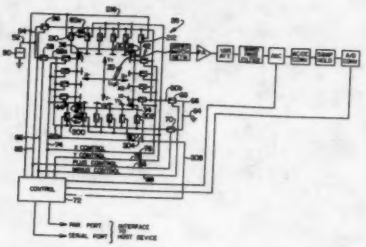
ELECTROGRAPHIC APPARATUS

Shiochiro Nakamura, Columbus, and Robert G. Kable, Dublin, both of Ohio, assignors to Scriptel Corporation, Columbus, Ohio

Filed Jun. 7, 1985, Ser. No. 742,734

Int. Cl.[4] G08C *21/00*

U.S. Cl. 178—18 **8 Claims**



1. An electrographic system comprising:

an electrically insulative substrate;

a resistive layer supported upon said insulative substrate and having an active area extending in an x— coordinate direction between first and second spaced apart edges and extending in a y— coordinate direction between third and fourth spaced-apart edges;

a first row of discrete, spaced-apart electrodes electrically coupled with said resistive layer intermediate said active area and said first edge;

a second row of discrete, spaced-apart electrodes electrically coupled with said resistive layer intermediate said active area and said second edge;

a third row of discrete, spaced-apart electrodes electrically coupled with said resistive layer intermediate said active area and said third edge;

a fourth row of discrete, spaced-apart electrodes electrically coupled with said resistive layer intermediate said active area and said fourth edge;

first corner electrode means coupled with said resistive layer at the juncture of said first and third rows;

second corner electrode means coupled with said resistive layer at the juncture of said first and fourth rows;

third corner electrode means coupled with said resistive layer at the juncture of said second and third rows;

fourth corner electrode means coupled with said resistive layer at the juncture of said second and fourth rows;

a position locator adjacent said active area;

a time varying excitation source of select frequency;

a ground reference;

switching means for applying said ground reference to said first row of electrodes and to said first and second corner electrodes and simultaneously applying said source to said second row of electrodes and to said third and fourth corner electrodes and electrically isolating said third and fourth rows of electrodes during a first operational mode, for reversing said applications of said ground reference and said source to said first and second rows of electrodes and to said first, second, third, and fourth corner electrodes and maintaining said electrical isolation of said third and fourth rows of electrodes during a second operational mode, for applying said ground reference to said third row of electrodes and to said first and third corner electrodes and simultaneously applying said source to said fourth row of electrodes and to said second and fourth corner electrodes and electrically isolating said first and second rows of electrodes during a third operational mode, and for reversing said applications of said ground reference and said source of said third and fourth rows of

electrodes and to said first, second, third and fourth corner electrodes and maintaining said electrical isolation of said first and second rows of electrodes during a fourth operational mode; and

control means for collecting a signal from said position locator.

4,649,233

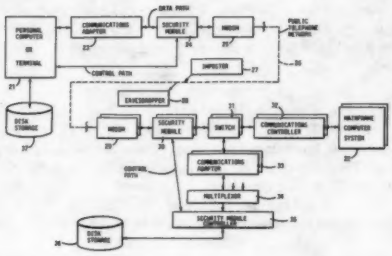
METHOD FOR ESTABLISHING USER AUTHENICATION WITH COMPOSITE SESSION KEYS AMONG CRYPTOGRAPHICALLY COMMUNICATING NODES

Walter E. Bass, Sunnyvale, Calif.; Stephen M. Matyas, Kingston, and Jonathan Oseas, Hurley, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 11, 1985, Ser. No. 722,091

Int. Cl.⁴ H04L *9/00*

U.S. Cl. 380—21 **16 Claims**



6. A method for establishing a key commutatively among n cryptographically communicating nodes and for authenticating node and user identities, said key being valid only for the duration of a single cryptographic session, each of the nodes having a local cryptographic facility including a plurality of pre-established cross-domain keys, and a concordance between a plurality of node and user identities and at least one identifier associated therewith, comprising the steps at each node of:

(a) transmitting its node and user identity to the (n−1) other nodes and responsively obtaining the identity of said (n−1) other nodes;

(b) generating a local random number, encrypting it under each of the pre-established cross-domain keys, transmitting each one of the set of encrypted random numbers to each one of the set of counterpart (n−1) other nodes, and decrypting under the counterpart cross-domain keys the encrypted random numbers received from the counterpart nodes;

(c) forming a parameter by combining the identifies derived or associated with the identities of the n nodes and users;

(d) forming an interim key from the composite of the local random and received encrypted random numbers; and

(e) combining the parameter with the interim key to produce the session key.

4,649,234

CIRCUIT ARRANGEMENT FOR TELECOMMUNICATIONS EXCHANGE SYSTEMS, PARTICULARLY TELEPHONE EXCHANGE SYSTEMS, COMPRISING INFORMATION PROCESSING SEQUENTIAL LOGIC SYSTEMS AND TRAFFIC MEASURING DEVICES

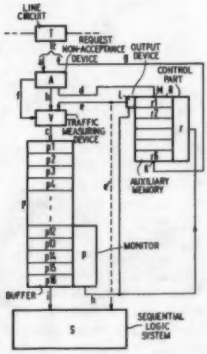
Herbert Jans, Neuried, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 11, 1985, Ser. No. 753,979

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1984, 3427621

Int. Cl.⁴ H04M *15/10*

U.S. Cl. 379—138 **8 Claims**



1. In a circuit arrangement for telecommunications exchange systems, particularly telephone exchange systems, of the type which includes an information processing sequential logic system having a limited call handling capacity with respect to its information processing capacity, in which a buffer precedes the sequential logic system and serves for a temporary acceptance of information processing requests, in which a traffic measuring device is connected to the buffer for recognizing information processing traffic overloads of the sequential logic system and for averting such overloads by way of a request rejection device preceding the traffic measuring device, the request rejection device quantitatively dividing the incoming processing requests into acceptable processing requests which are supplied to the buffer and into unacceptable processing requests which are not supplied to the buffer, the improvement therein comprising:

a first monitor connected to the buffer and operable to monitor the available buffer capacity;

a first in-first out-last in-first out (FIFO-LIFO) memory connected to the request rejection device and to said first monitor and to the traffic measuring device and operable as a FIFO memory in response to being full and processing requests are stored in the buffer to mark processing requests it has rejected as non-acceptable, and operable as a LIFO memory in response to a predetermined number of processing requests residing in the buffer to output processing requests and mark the same as acceptable.

4,649,235

TELEPHONE CIRCUIT WITH A CLASS-B AMPLIFIER OUTPUT STAGE

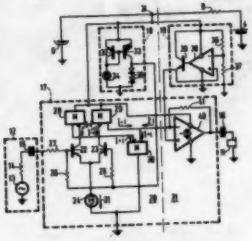
Peter J. M. Sijbers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 11, 1984, Ser. No. 680,430

Claims priority, application Netherlands, Dec. 15, 1983, 8304312

Int. Cl.[4] H04M *1/60*

U.S. Cl. 379—348 2 Claims



1. In a telephone circuit, having DC supply means:

a telephone amplifier connected to said DC supply means and comprising

an input stage;

a class-B amplifier output stage connected to said input stage for furnishing an output signal;

first DC operating level setting means connected to said input stage for setting a first DC operating level for said input stage;

and second DC operating level setting means connected to said class-B amplifier output stage for setting a second DC operating level for said class-B amplifier output stage which is independent of said first DC operating level;

said second level setting means comprising voltage divider means connected to said DC supply means and having a voltage divider tap, difference amplifier means having a first and second input and an output, said first input being connected to said voltage divider tap, and means for connecting said output to said second input and to said class-B amplifier output stage;

whereby said output signal is substantially unaffected by current variations of said DC supply.

4,649,236

DIGITAL SYSTEM CONNECT FRAME

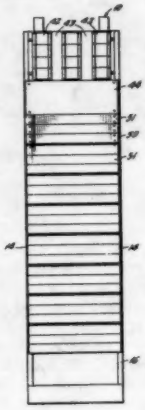
Paul V. De Luca, Plandome Manor; Albert Atun, Valley Stream, and Michael Shatzkin, Baldwin, all of N.Y., assignors to Porta Systems Corp., Syosset, N.Y.

Filed Dec. 23, 1985, Ser. No. 812,632

Int. Cl.[4] H05K *7/16*

U.S. Cl. 379—327 2 Claims

1. An improved telephone frame for cross connecting digital switching systems to provide central cross connect points comprising: a vertically oriented base frame element including first and second sides for the mounting of connecting elements; said first side defining an upper transversely extending area, said area having a plurality of first connector blocks mounted thereon in juxtaposed relation, and vertical and horizontal trough-forming means adjacent said connector blocks for receiving outside plant cables connected with said first connector blocks; said first side defining a lower transversely extending area disposed beneath said upper area, said lower area having a second plurality of connector blocks thereon, and vertical and horizontal trough-forming means for receiving inside plant cables connected with said second plurality of connector blocks; said second side of said base frame element defining a third upper transversely extending area corresponding to and oppositely disposed to said first transversely extending area, and having a third plurality of connector blocks thereon in juxtaposed relation, and vertical and horizontal trough-forming means for receiving outside plant cables connected to said third plurality of connector blocks; said second side defining a fourth lower transversely extending area opposite said second lower transversely extending area of said first side of said base frame element, and having a plurality of connector blocks forming jackfields, the individual jacks of which are connected to a connector block communicating with either outside plant or inside plant cables; whereby upon installation, said frame may be completely administered from said second side utilizing access to said jackfields at vertical levels corresponding to said fourth transversely extending area.



4,649,237

POWER LINE/TRANSFORMER SWITCH

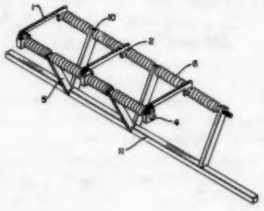
Gunnar Nilsen, Harestua; Erik Wang, Blommenholm, and Ingar Moen, Porsgrunn, all of Norway, assignors to A/S Norsk Elektrisk & Brown Boveri, Oslo, Norway

Filed Mar. 14, 1985, Ser. No. 711,896

Claims priority, application Norway, Mar. 15, 1984, 841013

Int. Cl.[4] H01H *21/54, 31/00*

U.S. Cl. 200—15 5 Claims



1. An overhead powerline/transformer switch of the isolater type comprising;

a first rotatable shaft member, being made of an insulating material;

a plurality of knife members for the respective phases disposed on said first shaft member;

a second fixed shaft member, made of an insulating material;

a plurality of contact members corresponding to said knife members, said contact members being disposed on said second shaft member for engaging said knife members;

a plurality of shrink-fitted insulator jackets mounted on said

first shaft between said knife members and on said second shaft between said contact members for preventing current leakage; and

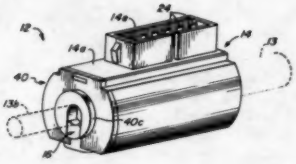
a V-shaped frame consisting of two integrally joined legs or supports at the apex of the V and said first and second shafts mounted at the other end of the legs or supports.

4,649,238

CLUTCH ACTUATOR SWITCH

Willi K. Beck, Hingham, and Andrew Strange, Watertown, both of Mass., assignors to Joseph Pollak Corporation, Boston, Mass.

Filed Dec. 2, 1985, Ser. No. 803,319
Int. Cl.[4] H01H *15/00*
U.S. Cl. 200—16 C **14 Claims**



1. A multi-function actuator switch assembled onto an actuator shaft movable along its length in a first direction, and which is fully enclosed once assembled, comprises,

a hollow housing formed of a resiliently deformable insulating material that extends along said first direction and has a longitudinal opening extending in said first direction which receives said shaft through said opening,

a plurality of terminals accessible from the exterior of said housing,

a plurality of electrical contacts mounted at the interior of said housing, each in electrical connection with a selected one of said terminals, said contacts being arrayed in pairs that are mutually spaced along said first direction,

a driver member mounted within said housing for movement generally along said first direction between an initial limit position and a fully extended limit position,

contact means mounted on said driver member arranged to establish electrical connection between a selected one of said pair of contacts depending on the position of said driver member within said housing,

deformable means for replaceably and operatively coupling said driver member to said shaft,

means for urging said driver member toward said initial position, and

means for replaceably covering said longitudinal opening to enclose the interior of said switch.

4,649,239

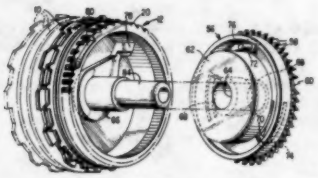
PROGRAM TIMER WITH VARIABLE TIME DELAY

John P. Duve, Brookfield, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 4, 1985, Ser. No. 784,022
Int. Cl.[4] H01H *43/00*
U.S. Cl. 200—38 R **5 Claims**

1. A program timer having a plurality of timing cams located on a rotating member and controlling the operation of switches in a predetermined program, said timer including a ratchet ring having spaced teeth mounted on said rotating member for movement therewith, a drive pawl, means for biasing said drive pawl against said ratchet ring, and drive means for reciprocating said drive pawl to advance the rotating memeber in a step-by-step manner, characterized by:

a ratchet wheel positioned adjacent said ratchet ring and aligned axially therewith, the root radii of the ratchet wheel teeth being no greater than the minimum root radius of the ratchet ring teeth, the drive pawl being of sufficient width to extend across at least a portion of both said ratchet ring and said ratchet wheel, some of said ratchet ring teeth being omitted in at least one position on the periphery of the ratchet ring so as to leave at least one gap where the drive pawl engages only the ratchet wheel teeth, means for coupling said rotating member to be moved by said ratchet wheel in one predetermined rela-



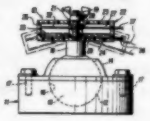
tive angular position of said ratchet wheel with respect to said rotating member, and manually operable means for moving said ratchet wheel independently of said rotating member to a selected angular position with respect to said rotating member so that when said drive pawl encounters said gap only said ratchet wheel is advanced until said predetermined relative angular position is attained.

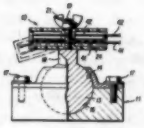
4,649,240

ELECTRIC TILT SWITCH WITH A LIQUID CONTACT CLOSER

Braxton E. Davis, Sr., 6243 S. Hermitage, Chicago, Ill. 60636

Continuation-in-part of Ser. No. 288,540, Nov. 12, 1981, abandoned. This application Jul. 12, 1985, Ser. No. 754,488
Int. Cl.[4] H01H *29/20, 35/14*
U.S. Cl. 200—61.47 **7 Claims**





1. An electrical tilt switch comprising:

a closed housing in the form of an annular enclosure having spaced annular top and bottom planar walls and spaced inner and outer vertical walls wherein at least the inner surfaces of the walls are of a material which is electrically non-conducting the enclosure having a bore therethrough for receiving a mounting stem;

a first electrode in the housing wherein the first electrode is annular in configuration and has a lead extending therefrom to the exterior of the housing;

a second electrode, also annular in configuration positioned in the housing and spaced vertically from the first elec-

trode, the second electrode having a lead extending therefrom, through the housing to the exterior of the housing;

a pool of conducting liquid within the housing, the pool of conducting liquid immersing the first electrode and providing continuous contact therewith, whereby when the housing is tilted the second electrode moves toward the pool of liquid and is engageable by the pool of liquid so as to electrically connect the first and second electrodes.

4,649,241

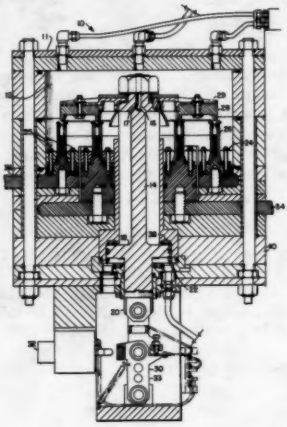
SOLENOID ACTUATED HIGH SPEED, HIGH CURRENT MAKING SWITCH WITH A MOVABLE CONTACT RING

John W. Young, Lilburn; Roger D. Luke, Stone Mountain; Henry J. Rhodes, Decatur, and Jeffrey K. Hudgins, Mableton, all of Ga., assignors to Siemens-Allis, Inc., Atlanta, Ga.

Filed Nov. 9, 1984, Ser. No. 669,947

Int. Cl.[4] H01H *35/38*

U.S. Cl. 200—82 R **18 Claims**



1. A making switch, comprising:

a housing defining a chamber therein;

a driver having a first end portion, a second end portion and a middle portion, said first end portion extending into the housing chamber, said middle portion and housing forming an air cylinder which controls the movement of the first end portion of the driver in the chamber;

a stationary contact ring having a plurality of contact fingers and being mounted in the housing;

a movable contact ring having a plurality of contacts engageable with the contact fingers and being movable by the driver between an open position at which the stationary and movable contacts are free of electrical engagement and a closed position at which the stationary and movable contacts are in electrical engagement;

a latch associated with the driver and which releasably abuttingly engages the driver with the stationary and movable contacts in the open position; and

a solenoid releasably operating the latch and freeing the driver of abutting contact by the latch allowing the contacts to close.

4,649,242

STATIONARY CONTACT ASSEMBLY FOR A CURRENT LIMITING CIRCUIT BREAKER

Andrew J. Kralik, Marysville, Ohio, assignor to Siemens Energy & Automation, Inc., Atlanta, Ga.

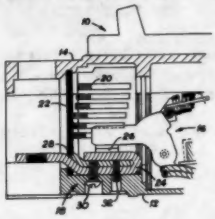
Filed Sep. 24, 1985, Ser. No. 779,682

Int. Cl.[4] H01H *33/20*

U.S. Cl. 200—147 R **13 Claims**

1. A stationary contact assembly for a circuit breaker of the type having a base, a line terminal and an arc chute, comprising:

a single piece of conductive material formed into a J-shaped contact arm having a contact affixed to an exterior surface of the short leg of the J and being connected to the base and line terminal, said short leg having a length sufficient



for creating electromagnetic repulsion forces in response to current flow of a preselected magnitude; and

an arc runner having a planar portion and being positioned between the legs of the J for drawing out an arc into the arc chute and intensifying the electromagnetic repulsion forces said arc chute having plates positioned parallel to the planar portion of the arc runner.

4,649,243

DOUBLE-ACTING, COMPRESSED GAS, HIGH TENSION CIRCUIT BREAKER WITH ACTUATING ENERGY ASSISTED BY THE THERMAL EFFECT OF THE ARC

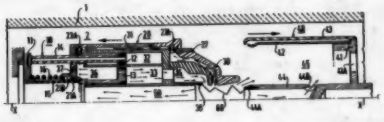
Edmond Thuries, Pusignan, France, assignor to Alsthom, Paris, France

Filed Jan. 13, 1986, Ser. No. 818,420

Claims priority, application France, Jan. 16, 1985, 85 00611

Int. Cl.[4] H01H *33/88*

U.S. Cl. 200—148 A **4 Claims**



1. In a double-acting, compressed gas, high tension circuit breaker in which the operating energy is assisted by the thermal effect of the arc, said circuit breaker comprising; an outer envelope housing a gas having good dielectric properties, a moving assembly within said envelope having main contacts and arcing contacts, means for electrically connecting said moving assembly to a first electricity connection point, a fixed assembly within said envelope connected to a second electricity connection point of the circuit breaker, a semi-moving assembly within said envelope interposed longitudinally between said moving assembly and said fixed assembly, means electrically connecting said semi-moving to said fixed assembly, resilient means mechanically connecting said semi-moving assembly to said fixed assembly, main contacts and arcing contacts carried by said semi-moving assembly for engagement respectively with the main contacts and the arcing contacts of the moving assembly, the improvement comprising a chamber constituted by a first piston and a second piston fixed to the fixed assembly and by an end plate common to a first and to a second volume both of which are of annular section, in which said pistons slide respectively, said end plate and said volumes constituting a portion of the semi-moving assembly, said pistons being provided with piston rods passing through said end plate, at least one duct placing the arcing zone into communication with the inside of the chamber, means communicating the inside of the first volume with the outside of the semi-mov-

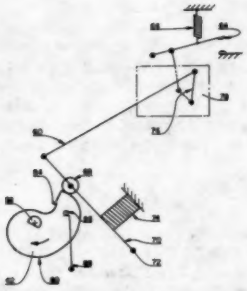
ing assembly, and means communicating the second volume with the arcing zone; whereby, the energy from the arc is used to assist in displacing the contacts of the circuit breaker relative to each other and wherein a portion of the arc energy is taken to compress a cold volume of said gas without heating the gas and employing said compressed cold gas to blast the arc.

4,649,244

CONTROL DEVICE OF AN ELECTRIC CIRCUIT BREAKER

Pierre Baginski, Grenoble, and Jean-Pierre Nebon, St. Martin-le-Vinoux, both of France, assignors to Merlin Gerin, Grenoble, France

Filed Jan. 18, 1985, Ser. No. 692,699
Claims priority, application France, Jan. 30, 1984, 8401527
Int. Cl.⁴ H01H *3/30*
U.S. Cl. 200—153 SC **3 Claims**



1. A control device for an electric circuit breaker having stationary and movable contacts, an opening spring for shifting the movable contact to an open position, a closing spring for shifting the movable contact to a closed position, an opening spring charging mechanism for charging the opening spring at the time the movable contact is moved to its closed position, and a closing spring charging mechanism including a shaft and a cam mounted on said shaft; a motor for driving said shaft in rotation in a predetermined direction; a cam-follower roller mechanically coupled to said closing spring and to said movable contact; said cam having a profile including three successive sectors:

a first sector effecting shift of said roller by rotation of said cam to charge said closing spring,

a second sector at which the action of the closing spring, through said roller, on said cam is such as to urge the cam in rotation in said predetermined direction, and

a third sector in which the roller is released for snap-action shifting, by the closing spring, of the circuit breaker movable contact to its closed position;

latch means for latching the cam in a position wherein said roller is at said second cam sector; and detection means, actuated by rotation of said shaft, for detecting a position of said cam and for controlling the charging operation of the closing spring by terminating the rotation of the cam by said motor; said detection means and said motor being grouped into a preassembled motor reducing sub-assembly, the circuit breaker, cam, shaft, and opening and closing springs being grouped in another sub-assembly, said motor reducing sub-assembly being couplable to said shaft; and

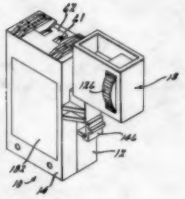
a mechanical linkage connecting said motor and said shaft, said linkage including disconnecting means for stopping said motor and for disconnecting said linkage when said roller is disposed at said second sector of said cam.

4,649,245

VARIABLE SPEED TRIGGER SWITCH

William R. Lessig, III, Hunt Valley; Dale K. Wheeler, Fallston; R. Roby Bailey, Jr., Forest Hill, all of Md., and Stephen W. Smith, Raleigh, N.C., assignors to Black & Decker Inc., Newark, Del.

Filed Aug. 9, 1985, Ser. No. 764,340
Int. Cl.⁴ H01H *9/06, 13/08*
U.S. Cl. 200—157 **5 Claims**



1. A variable speed trigger switch for a power tool, comprising:

a housing defining an enclosed channel having an opened end defined by a trigger aperture, said housing defining a first extending ridge within said channel,

a trigger slidable within said enclosed channel,

spring means for biasing said trigger to an extended position from said housing,

detent means carried by said trigger, said detent means defining a second extending ridge which engages said first ridge when said trigger is retracted within said channel to a predetermined position, said engagement between said first and second ridges causing an increase in force necessary to further retract said trigger, and

adjustment means for changing the relative positioning of said first and second ridges, thereby changing said first predetermined trigger retracted position.

4,649,246

KEYBOARD FOR INITIATING SWITCHING OPERATIONS OR SWITCHING SIGNALS ASSOCIATED WITH RESPECTIVE SYMBOLS ON THE SURFACES OF THE KEYS

Theobald Schmid, Munich; Horst Widmaier, Grossbesselohe, and Friedrich Wolf, Planegg, all of Fed. Rep. of Germany, assignors to Hand Widmaier Fabrik fur Apparate der Fernmelde -und Feinwerktechnik, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 491,894, May 5, 1983, now Defensive Publication No. 4,531,033. This application Feb. 25, 1985, Ser. No. 689,878
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1983, 8302660[U]
Int. Cl.⁴ H01H *9/16, 13/70*
U.S. Cl. 200—159 B **7 Claims**

1. A keyboard for initiating switching functions or switching signals, said keyboard having alpha-numeric symbols imprinted thereon and comprising:

an electrically insulative contact set carrier plate;

a plurality of conductive path regions arranged in a regular repetitive pattern on said carrier plate;

a guide matrix structure mounted above said carrier plate, said matrix having a plurality of hollow cylindrical guiding elements formed therein in a rectangular arrangement of rows and columns, each said guiding element having an inner wall;

axially movable key means extending through and being guided within each of said guiding elements, said key means comprising:

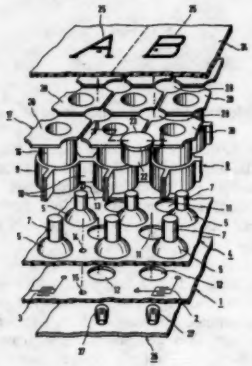
an elastic switch actuating diaphragm in juxtaposition with said carrier plate;

a snap-action cup portion of said diaphragm formed integrally therewith, the concave side of said cup portion normally spaced above said carrier plate;

a contact set actuating plunger integrally formed with said cup portion and extending upwardly from the convex side of said cup portion into a respective one of said guiding elements;

a hollow cylindrical guide stem positioned in said guiding element to engage said plunger, said cylindrical guiding element, said cylindrical guide stem and said plunger being disposed in concentric relationship with said guide stem being disposed between said guiding element and said plunger so that said plunger is guided for axial movement;

an electrically conductive bridging element mounted to at least some of said key means and aligned with one of said plungers, said bridging element being normally spaced



from and in juxtaposition with one of said conductive path regions, each said bridging element and conductive path region comprising a contact set, each said contact set being selectively actuatable upon depression of said key means;

said keys means being arranged in groups of four, one of said symbols being associated with each said group of key means; and

key depression means at the mutual intersection of the top of each said group of key means and aligned with one of said symbols;

whereby when one of said symbols is depressed, all of the keys in the group associated with that symbol are depressed, the arrangement of said key means ensuring axial movement thereof and positive actuation of the two said contact sets in that group to initiate a switching function associated with said depressed symbol.

4,649,247

CONTACT ASSEMBLY FOR LOW-VOLTAGE CIRCUIT BREAKERS WITH A TWO-ARM CONTACT LEVER

Bernhard Preuss, and Karl-Heinz Manthe, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 20, 1985, Ser. No. 767,579

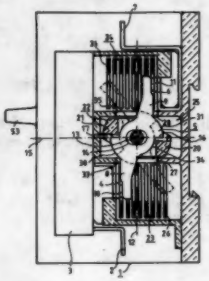
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1984, 3431288

Int. Cl.[4] H01H *1/32*

U.S. Cl. 200—244 **6 Claims**

1. A contact assembly for a low-voltage circuit breaker having a two-armed contact lever and being equipped with a contact piece at each end on opposite facing sides of a longitudinal axis and each lever arm being assigned a biasing spring, comprising:

a swivel mount for the contact lever having a fixed bearing pin for providing an axis of rotation and a slot in the contact arm enclosing the bearing pin, the longitudinal axis of the slot extending approximately at a right angle to the longitudinal axis of the contact lever, and



said contact lever having at least one stop surface extending approximately at a right angle to the longitudinal axis of the contact lever and being matable with a catch, the catch being an integral component of a switching shaft which is swivel-mounted on the bearing pin for moving the contact lever in the switch-off direction.

4,649,248

ANNEALING FURNACE FOR ANNEALING MAGNETIC CORES IN A MAGNETIC FIELD

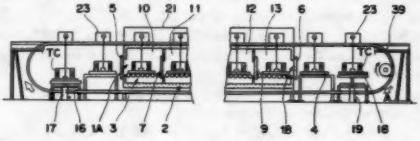
Hiroshi Yamaguchi, Akashi; Teruaki Tanaka, Kobe; Masatake Hirai, Kyoto; Tadashi Kokketsu; Masahiro Matsumoto, both of Nagoya, and Kenji Kawate, Inuyama, all of Japan, assignors to Allied Corporation, New York, N.Y.

Filed Jun. 4, 1985, Ser. No. 741,255

Claims priority, application Japan, Jun. 5, 1984, 59-114761; Jun. 14, 1984, 59-126090; Jul. 9, 1984, 59-142077

Int. Cl.[4] H05B *6/10*

U.S. Cl. 219—10.57 **4 Claims**



1. A furnace for annealing magnetic cores in a magnetic field comprising:

a. a furnace body forming at least an annealing chamber and having a heat source therein;

b. a plurality of tray means, each of which is adapted to support a core thereon to be annealed in the furnace in a magnetic field;

c. means for transporting the plurality of tray means, each of which has a magnetic core thereon, through the annealing chamber;

d. a plurality of magnetizing means for generating a magnetic field for magnetic cores in the annealing chamber, each of which has at least a portion thereof movable between first and second positions, in said first position said portion being so positioned as to form a closed loop for generating a magnetic field for the core and, and in

said second position said portion being removed from the core so as to allow the core to move relative thereto; and

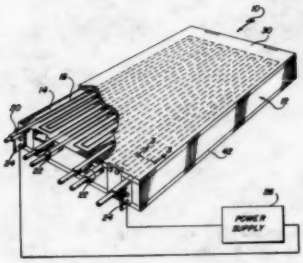
e. a current source for supplying electric current to each magnetizing means.

4,649,249

INDUCTION HEATING PLATEN FOR HOT METAL WORKING

Louis Odor, Columbus, Ohio, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 13, 1985, Ser. No. 776,064
Int. Cl.[4] H05B *6/10*
U.S. Cl. 219—10.73 **3 Claims**



1. A heating platen for use with a press, comprising: a castable ceramic plate having a channel at an upper surface thereof, the channel having an approximately sinusoidal shape in order to maximize area coverage of said upper surface of said ceramic plate, said ceramic plate being capable of withstanding compressive forces of approximately 5000 psi at temperatures of approximately 1700° F.;

a trough mounted within the channel, said trough being open at its upper lengthwise side, said trough being an electrical conductor, said trough comprising lengthwise segments, said segments having a plastic coating in order to provide electrical insulation from each other;

a top plate, said top plate being an electrical conductor;

an electrical power source;

a tube mounted within said trough, said tube electrically connected to said power source, said tube conducting cooling fluid therethrough in order to minimize increase in the elctrical resistivity of said tube due to heating of the same, said tube conducting a low frequency electrical current to heat said top plate by means of electromagnetic induction such that a temperature of approximately 1800° F. can be attained within approximately 25 minutes;

a ceramic inlay mounted in the channel and covering said tube and said trough, said inlay electrically insulating said tube and said trough from said top plate;

a steel base plate supporting said ceramic plate;

an electrical insulator mounted between said trough and said tube, said electrical insulator composed of silicone rubber and ceramic cement material;

a filler mounted between said ceramic plate and said tube, said filler being composed at least partly of silicone rubber.

4,649,250

PIPE WELDER

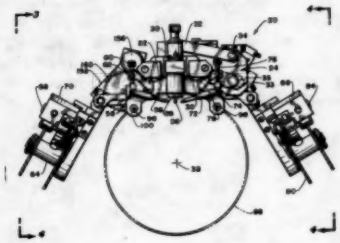
Gasparas Kazlauskas, 10219 Briarwood Dr., Los Angeles, Calif. 90024

Filed Jun. 10, 1985, Ser. No. 742,897
Int. Cl.[4] B23K *37/02, 9/12*
U.S. Cl. 219—60 A **5 Claims**

1. A pipe welder comprising:

track means adapted to be fixedly mounted onto a pipe, said track means extending entirely around the circumference of the pipe, said track means including gear engaging means, said track means defining a pair of side edges;

a welding head assembly mounted by mounting means on said track means, said welding head assembly including drive means, said drive means to be in continuous engagement with said gear engaging means, said drive means being attached to said welding head assembly by a flex joint assembly, said flex joint assembly permitting limited movement of the drive means relative to said welding head assembly in a direction toward and away from said track means between a retracted position and an operating position, said retracted position being when said drive means is spaced from said track means, said operating position being when said drive means connects with said gear engaging means, with said drive means in said operating position said flex joint assembly causing the applying of a resilient force pressing said drive means into continuous engagement with said gear engaging means;



motor means for rotating said drive means to move said welding head assembly along said track means;

said drive means including a drive gear, said drive gear being mounted on and solely supported by a thin strip of rigid material, said motor means being mounted on said drive means, said thin strip of rigid material being slightly flexible exerting a continuous bias tending to maintain said drive gear in continuous contact with said track means when said drive means is in said operating position; and

said thin strip of material being attached to a flex joint housing, said welding head assembly including a welding head housing, said flex joint housing being pivotly mounted to said welding head housing, a spring assembly mounted between said welding head housing and said flex joint housing, said spring assembly exerting a continuous force tending to locate said flex joint housing in said retracted position.

4,649,251

BLANK GUIDE DEVICE OF RESISTANCE WELDING MACHINE FOR SEAM WELDING OF CAN BODY

Takayuki Kai, Osaka, Japan, assignor to Daiwa Can Company, Limited, Tokyo, Japan

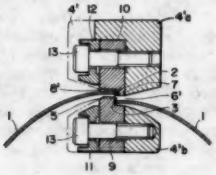
Filed Feb. 21, 1985, Ser. No. 704,002
Claims priority, application Japan, Feb. 27, 1984, 59-35677
Int. Cl.[4] B23K *11/06*
U.S. Cl. 219—64 **1 Claim**

1. A blank guide device for a seam welding machine for producing can bodies, said device comprising:

a body having an upper groove opening out of one side thereof and a lower groove opening out of the other side thereof for guiding respective edges of a cylindrically-rolled blank to a welding point between opposed welding means for welding the edges to produce a cylindrical can body;

upper and lower vertically spaced projecting portions projecting from a forward end of said body and having block receiving recesses therein each having at least a portion thereof opening toward the corresponding block receiving recess in the other projecting portion; and

a pair of blocks removably mounted in said block receiving recesses each having a surface thereon in spaced opposed relation to the corresponding surface on the other block and said surfaces having opposed L-shaped cross-sectional recesses therein with long sides thereof opposed to the



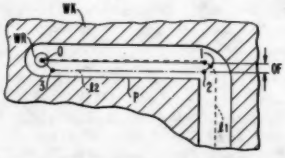
other block and short sides thereof extending toward each other and facing in opposite lateral directions, said L-shaped recesses extending along the entire length of said blocks and forming continuations of corresponding surfaces of the grooves in said body and forming forward end portions of said grooves.

4,649,252

WIRE-CUT ELECTRIC DISCHARGE MACHINING METHOD

Haruki Obara, Sagamihara, Japan, assignor to Fanuc Limited, Minamitsuru, Japan

Continuation-in-part of Ser. No. 204,273, Nov. 5, 1980, abandoned. This application Sep. 1, 1983, Ser. No. 529,225
Claims priority, application Japan, Nov. 9, 1979, 54-145237
Int. Cl.⁴ B23H *7/06*
U.S. Cl. 219—69 W **16 Claims**



8. A wire-cut electric discharge machining method for cutting a workpiece along a predetermined path using a wire-cut electric discharge machine controlled by a numerical control device, said method comprising the steps of:

dividing said predetermined path into a plurality of predetermined segments;

rough-cutting a first segment of said predetermined path by moving the wire of said electric discharge machine with respect to the workpiece while producing a high-current short-pulse discharge between the wire and workpiece;

finish-cutting the first segment of said predetermined path by moving the wire of said electric discharge machine with respect to the workpiece while producing a low-current pulse discharge between the wire and workpiece; and

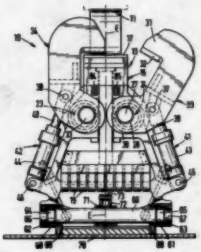
repeating the steps of rough-cutting and finish-cutting for the next segment.

4,649,253

APPARATUS FOR BUTT WELDING AUTOMOTIVE WHEEL RIM BLANKS

Hans R. Zollinger, Geroldswil, Switzerland, assignor to H. A. Schlatter AG, Schlieren, Switzerland

Filed Aug. 27, 1985, Ser. No. 769,682
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1984, 3432488
Int. Cl.⁴ B23K *11/02*
U.S. Cl. 219—101 **6 Claims**



1. An apparatus for butt-welding axially slit, hollow cylindrical blanks each having two sides in order to form wheel rim hoops, comprising:

means for pressing together mutually confronting edges of an axial slit of a hollow cylindrical blank;

clamping devices associated with each region of the hollow cylindrical blank adjoining the axial slit for fixedly clamping each said region and for conducting an electrical welding current to each said region;

each clamping device of said clamping devices comprising a fixed first clamping jaw and a moveable second clamping jaw;

a source of electrical welding current;

said fixed first clamping jaw being connected to said source of electrical welding current;

each hollow cylindrical blank having an inner circumference and two sides;

said moveable second clamping jaw being intended to engage one hollow cylindrical blank at a time at said inner circumference;

said moveable second clamping jaw being moveable toward and away from said fixed first clamping jaw;

each said movable second clamping jaw comprising two partial jaw members;

said two partial jaw members having a substantially pincer-like configuration;

respective means for axially pivoting each of said two partial jaw members of each clamping device into said inner circumference of each hollow cylindrical blank from both of said two sides thereof with a pivoting motion;

respective means for imparting a substantially straight advance motion to each of said two partial jaw members of each clamping device toward said associated fixed first clamping jaw; and

said pivoting motion being independent of said substantially straight advance motion of said two partial jaw members toward said associated fixed first clamping jaw.

4,649,254

AMORPHOUS METAL RIBBON FABRICATION

John R. Bedell, Madison, N.J., and Eli Rosenthal, Brooklyn, N.Y., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed May 16, 1985, Ser. No. 734,553
Int. Cl.⁴ B23K *26/00*
U.S. Cl. 219—121 LD **10 Claims**

1. A method for the substantially continuous welding of at

least two amorphous or glassy metallic ribbons into a composite glassy metallic body, comprising:

drawing the ribbons in converting fashion into firm contact with each other at a nip between two moving substrates;

projecting and focusing a high intensity source of energy substantially at the centerline of the nip between the converging and contacting ribbon surfaces;

melting a weldment on each of the converging and contacting ribbon surfaces with the energy source while limiting

the total energy absorbed by the ribbons, whereby the energy is distributed in the resulting composite body so as to be maintained at a temperature below the recrystallization temperature for the ribbon;

compressing the ribbons at the nip between the substrates to form the ribbons into the composite amorphous body; and

cooling said body internally at a rate sufficient to resolidify the weldment and retain the body including the weldment in an amorphous metallic state.

4,649,255

EDM USING A PARTITION MEMBER TO SEPARATE HYDROCARBON AND WATER LIQUIDS IN THE WORK TANK

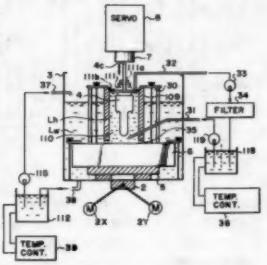
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Continuation-in-part of Ser. No. 394,509, Jul. 2, 1982, Pat. No. 4,473,733. This application Jun. 1, 1984, Ser. No. 616,559

Claims priority, application Japan, Jun. 3, 1983, 58-100102; Aug. 1, 1983, 58-139457

Int. Cl.[4] B23H *1/08, 7/34*

U.S. Cl. 219—69 M **10 Claims**



1. A method of machining a conductive workpiece wherein a tool electrode is spacedly juxtaposed with the workpiece in a machining receptacle to define an erosion gap over a machining area between the juxtaposed electrode and workpiece and a succession of electrical discharges are effected across said gap over said area to electroerosively remove material from the workpiece over said machining area, the method comprising the steps of:

dividing, by partition means, a space surrounding a workpiece in a machining receptacle into a first chamber directly surrounding and contiguous with a machining area and a second chamber outside of said first chamber and surrounding a portion of said workpiece which is remote from said machining area;

flooding said machining area and said first chamber with a machining medium constituted by a liquid hydrocarbon so that electrical discharges are effected therethrough;

flooding said second chamber with a coolant constituted by a water liquid in contact with said portion of the workpiece to sufficiently cool the latter against heating thereof due to the erosive discharges in said first chamber; and

relatively displacing the tool electrode and the workpiece to advance removal of material in the workpiece during said flooding of said area and said chambers.

4,649,256

HIGH-FREQUENCY ELECTRIC RESISTANCE WELDING METHOD USING IRRADIATION WITH A LASER BEAM

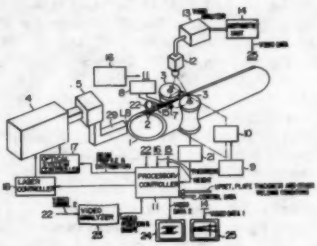
Katsuhiro Minamida; Hideo Takafuji, both of Kawasaki; Hiroya Haga, and Nobuo Mizuhashi, both of Sagamihara, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 31, 1985, Ser. No. 814,952

Claims priority, application Japan, Jan. 10, 1985, 60-2444; Jan. 10, 1985, 60-2447; Jan. 11, 1985, 60-3000; Feb. 12, 1985, 60-24916

Int. Cl.[4] B23K *26/00*

U.S. Cl. 219—121 LD **5 Claims**



1. A high-frequency electric resistance welding method combined with the irradiation of a laser beam, comprising the steps of:

continuously feeding a workpiece and forming opposed edges thereof into a wedge shape by causing them to converge as they are butted against each other;

heating the butted opposed edges with a high-frequency electric current; and

presetting a position for a laser beam to be projected against the vertex of the butted edges of the wedge shape at the level being in a range of from above 30% and below 80% of the thickness of the butted edges at the workpiece including a central position of the thickness;

projecting a laser beam against the vertex of the butted edges of the wedge shape from its open side at said predetermined level of said thickness, to thereby heat the vertex of the butted edges of the wedge shape to a welding temperature;

whereby the butted edges of the workpiece are uniformly heated through the entire range of said thickness.

4,649,257

GAS DISTRIBUTION RING FOR PLASMA GUN

Daniel Yakovlevitch, Bayside, and Anthony J. Rotolico, Hauppauge, both of N.Y., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

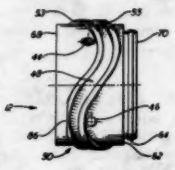
Filed May 6, 1986, Ser. No. 860,286

Int. Cl.[4] B23K *9/00*

U.S. Cl. 219—121 PP **17 Claims**

1. A gas distribution ring for use in a plasma gun, comprising a ring member with an axis and a cylindrical outer surface and having therein one or more first gas inlet orifices and one or more second gas inlet orifices, the first and second orifices extending from the outer surface inwardly through the ring member proximate to a plane that is oriented perpendicularly to the axis of the ring member, the outer surface having an undulated O-ring groove formed therein, the first and second orifices being positioned at the outer surface cooperatively

with respect to the undulated O-ring groove such that the first orifices are isolated on one side of the undulated O-ring groove



and the second orifices are isolated on the other side of the undulated O-ring groove.

4,649,258

WATER TREATMENT FOR WATER INJECTION PLASMA ARC CUTTING APPARATUS

James E. Lynch, 115 S. Harrison Ave., Pittsburgh, Pa. 15202

Continuation-in-part of Ser. No. 488,353, Apr. 25, 1983, abandoned. This application Sep. 25, 1985, Ser. No. 779,936

Int. Cl.[4] B23K *15/00*

U.S. Cl. 219—121 PY **2 Claims**

1. The process of treating by reverse osmosis raw cooling water containing dissolved solids for a metal underwater plasma arc cutting torch or the like to increase the service life of said torch comprising:

(a) determining from a representative raw water sample the total dissolved solids content of said sample;

(b) calculating the potential corrosiveness or scale forming tendency of said raw water as measured by Langelier's Index, Ryznar's stability Index, or both;

(c) determining from (a) and (b) the reverse osmosis membrane or membranes necessary for maintaining the Ryznar's Stability Index of the treated water within the range of about 5.5–7.5.

4,649,259

DEVICE FOR WELDING FOILS HAVING DIFFERENT THICKNESS ALONG A WELD LINE

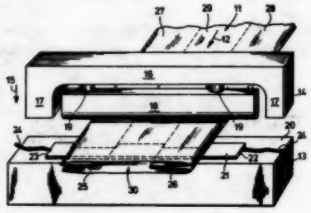
Karl Zarn, Rosengarten-Westheim, Fed. Rep. of Germany, assignor to Optima-Maschinenfabrik Dr. Buhler GmbH & Co., Fed. Rep. of Germany

Filed Mar. 7, 1985, Ser. No. 709,337

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1984, 3408901

Int. Cl.[4] H05B *3/00*; B65B *51/14*; B30B *15/34*

U.S. Cl. 219—243 **7 Claims**



1. A device for welding foils, webs and bags having differing thickness along a line to be welded at right angles to a conveying direction, the device comprising:

welding dies at right angles to the conveying direction and which dies are movable relative to one another, one of said dies having an elongated periodically heatable electric resistance heating element aligned at right angles to the conveying direction, said heating element being a continuous strip having a plurality of adjacent serially-connected sections of differing widths, the sections having different electrical resistances as a result of their differing widths, the heating element being connectable to an electric potential and thereby heatable to a plurality of different elevated temperatures along an entire length of the heating element so that, prior to contacting the line to be welded, the heating element has a higher temperature in sections of lesser width, said sections of lesser width corresponding in length and location to the thicker areas along the line to be welded, whereby the heating element is adapted to initially apply the higher temperature to the thicker areas and a lower elevated temperature to the thinner areas, the differing widths of the sections of the heating element being dimensioned such that the heating element has a constant temperature over its entire length immediately after contacting the line to be welded and forms a continuous weld.

4,649,260

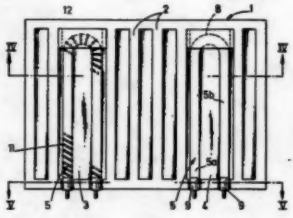
LIGHTER FOR STOVE, OPEN HEARTH AND SIMILAR

Florentinus Melis, Westmalle; Jan Verbergt, Zoersel, and Willy Van Rooy, Malle, all of Belgium, assignors to Coal-O-Matic PVBA, Belgium

Continuation of Ser. No. 494,333, Mar. 16, 1983, abandoned, which is a continuation-in-part of Ser. No. 188,907, Sep. 19, 1980, abandoned. This application Mar. 6, 1986, Ser. No. 838,398

Int. Cl.[4] F23Q *7/22*

U.S. Cl. 219—267 **7 Claims**



1. In an improved combustion apparatus for burning solid fuels, said apparatus having a grate including spaced portions defining a space therebetween and an upper surface, the improvement comprising:

at least one electric ignition element having a tube-like support of refractory insulating material having a helical outer groove, and a resistance heater wire element within said groove and having at least a portion thereof, carried by the support, free of any fire-proof insulative casing and disposed to be spaced from said grate in said space, said support having opposite ends, cylinder-like insulative support means mounting the opposite ends of the support on the grate with the portion of the resistance element carried by the support juxtaposed to said grate upper surface to be directly contacted by solid fuels on said upper surface of the grate whereby said fuel may be supported partially by said grate and partially directly by said heater wire element while maintaining the heater wire element spaced from the grate to effectively maximize the fuel igniting temperature thereof, said heater wire element being electrically insulated from the grate by said insulative support means and said heater wire element including electrically conductive means extending through said cylinder-like support means.

4,649,261

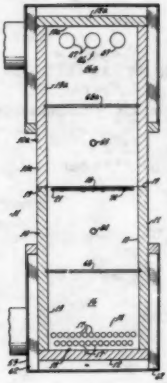
APPARATUS FOR HEATING SEMICONDUCTOR WAFERS IN ORDER TO ACHIEVE ANNEALING, SILICIDE FORMATION, REFLOW OF GLASS PASSIVATION LAYERS, ETC.

Ronald E. Sheets, Santa Ana, Calif., assignor to Tamarack Scientific Co., Inc., Anaheim, Calif.

Continuation-in-part of Ser. No. 584,322, Feb. 28, 1984. This application Feb. 7, 1985, Ser. No. 699,411

Int. Cl.[4] F27B *5/14;* F27D *11/02*

U.S. Cl. 219—390 49 Claims



1. Heating apparatus, comprising:

(a) lamp means,

(b) means to support a workpiece, and

(c) means to optically couple said lamp means to a workpiece supported on said workpiece-support means, to effect relatively uniform heating of said workpiece, said optical coupling means being a hollow, integrating light pipe that extends at least substantially to said workpiece-support means and that causes the intensity of the light from said lamp means to be relatively uniform across said light pipe at said workpiece, said lamp means being disposed within said light pipe, the aspect ratio in said light pipe being at least 1.

4,649,262

HEATING CYLINDER DEVICE FOR A MOLDING MACHINE

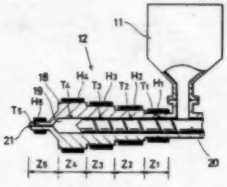
Norio Yoshikawa, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jan. 23, 1985, Ser. No. 694,151

Claims priority, application Japan, Jan. 23, 1984, 59-10760; Mar. 13, 1984, 59-35463[U]; Mar. 14, 1984, 59-36547[U]; Mar. 15, 1984, 59-37158[U]

Int. Cl.[4] F27B *14/06*

U.S. Cl. 219—421 10 Claims



1. A heating cylinder device for a molding machine, said device comprising a thermally conductive cylinder member including a central axial hole and a plurality of heating zones disposed axially along said cylinder member, each of said heating zones comprising a heater and means cooperating with said heater for individually controlling a temperature within a portion of said central axial hole disposed within a respective said heating zone to correspond to a predetermined temperature and operational performance desired for a respective said heating zone, the external diameter of said cylinder member containing said heating zones being stepwise varied to define said heating zones with each of said zones having a different external diameter for said cylinder member.

4,649,263

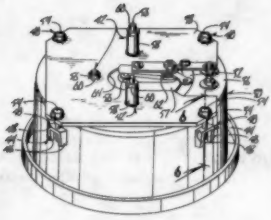
HEATING KETTLE

John D. Goodlaxson, Colfax, Iowa, assignor to Goodlaxson Mfg. Inc., Colfax, Iowa

Filed Dec. 16, 1985, Ser. No. 809,397

Int. Cl.[4] F27D *11/02*

U.S. Cl. 219—438 7 Claims



1. A heating kettle, comprising:

a pot having a flat bottom wall and a side wall;

a flat rigid disc ring heating element with a central hole, said heating element being in intimate contact with the pot bottom wall to heat said pot;

a flat rigid nongrooved hold-down plate means for holding said heating element against said bottom wall of said pot;

first fastener means on said side wall of said pot for compressively securing said hold-down means to said pot such that said heating element is securely sandwiched between said hold-down means and said bottom wall of said pot and thereby held in intimate contact with said bottom wall of said pot and said hold-down plate so as to minimize deformation of said bottom wall of said pot and of said heating element during use of said kettle, and

second fastener means on said bottom wall of said pot extending through the central hole of the heating element for further securing said hold-down means to said pot such that said heating element is more securely sandwiched between said hold-down means and said bottom wall of said pot.

4,649,264

ELECTRONIC VOTING MACHINE

William H. Carson, Indianapolis, Ind., assignor to Carson Manufacturing Company, Inc., Indianapolis, Ind.

Filed Nov. 1, 1985, Ser. No. 794,071

Int. Cl.[4] G07C *13/00*

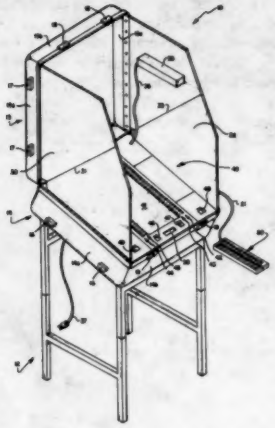
U.S. Cl. 235—54 F 44 Claims

1. A portable, self-contained electronic voting machine for use by a voter in casting a vote in an election, said voting machine comprising:

a motor-driven mechanism for carrying printed ballots having voter selections indicated thereon, the mechanism visually presenting to the voter only a preselected portion of the printed ballots at any one time;

a plurality of switch means fixed in position relative to the mechanism, the switch means being positioned next to all voter selections on the preselected portion of the printed

ballots then being viewed by the voter, the voter actuating selected ones of the switch means to make vote selections; and



programmable electronic control means for actuating the motor-driven mechanism and for recording the vote selections indicated by said actuated selected ones of the switch means.

4,649,265

METHOD FOR PROTECTION AGAINST THE RE-TRANSFER OF UNIQUELY RECORDED INFORMATION ON A DATA CARRIER AND APPARATUS FOR RECORDING AND/OR READING RE-TRANSFER-PROTECTED INFORMATION

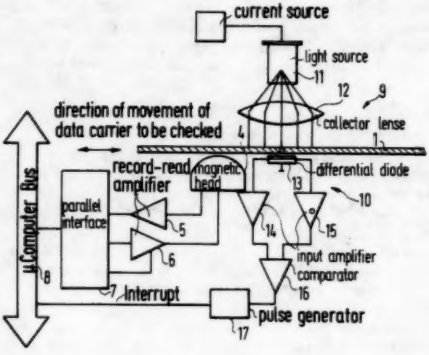
Hermann Stockburger, St. Georgen, and Siegfried Bauer, Furtwangen, both of Fed. Rep. of Germany, assignors to Copytex GmbH Sicherheitssysteme, Fed. Rep. of Germany

Continuation of Ser. No. 308,504, Oct. 5, 1981. This application Mar. 4, 1985, Ser. No. 707,583

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1980, 3038614

Int. Cl.[4] G06K *15/02*

U.S. Cl. 235—380 **12 Claims**



1. A data carrier representing an actual value formed, in use, by devaluation from an initial total value comprising a magnetic strip with at least one data storage track, indicator means with a detactable marking having a variable position, said position being irreversibly adjustable in a direction substantially parallel to said data storage track in accordance with the actual value of said data carrier as compared to an initial total value, a first set of data bits, a second set of data bits and a third set of data bits stored in that data storage track, said second set of data bits representing a relationship between bits of said first set of data bits and the geometric position of said detectable marking and said third set of data bits indicating the actual value of said data carrier as represented by said detectable marking.

4,649,266

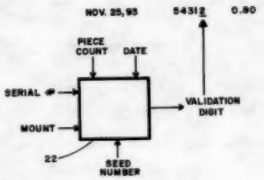
METHOD AND APPARATUS FOR VERIFYING POSTAGE

Alton B. Eckert, Norwalk, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 12, 1984, Ser. No. 588,464

Int. Cl.[4] G06F *15/12*

U.S. Cl. 235—432 **12 Claims**



1. A method of verifying postage through an encrypted mark that is part of alphanumeric indicia applied to a mail piece, comprising:

storing a seed number,

inputting postal data to be imprinted on the mail piece,

deriving a single encrypted alphanumeric character based upon the stored seed number and input postal data, and

imprinting said mail piece with indicia including a string of alphanumeric characters representing at least a portion of said data and including said single encrypted alphanumeric character as the only encryption of said indicia.

4,649,267

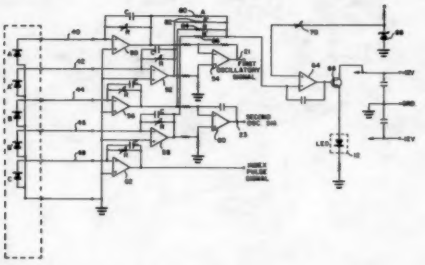
AUTOMATIC GAIN CONTROL CIRCUIT FOR ENCODER

David J. Ray, San Juan Capistrano, Calif., assignor to ILC Technology, Inc., Sunnyvale, Calif.

Filed Apr. 26, 1984, Ser. No. 604,325

Int. Cl.[4] G01J *1/32*; G01D *5/34*

U.S. Cl. 250—205 **7 Claims**



1. A gain control circuit for controlling a radiating source that cooperates with photodetector means responsive thereto, said photodetector means receiving a predetermined average

level of radiation on a substantially continuous basis, the photodetector means including a plurality of phototransducers, each respectively connected to an amplifier, comprising in combination:

first means coupled to the photodetector means to provide a response signal corresponding to and representative of the radiation intensities continuously being received from the source, said first means including a summing junction connected to receive the outputs of each of said amplifiers;

second means for establishing a reference level signal corresponding to a desired photodetector means output signal in response to an adequate level of received radiation; and

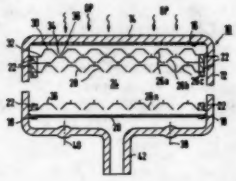
feedback circuit means coupled to said first means summing junction, said second means and the radiating source, and operable in response to first and second means signals for controlling the radiating source to produce a level of radiation adequate to provide a first means signal having a predetermined relationship to said reference signal.

4,649,268

IMAGING DYNODES ARRANGEMENT

Dennis E. Persyk, Barrington, Ill., assignor to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed Mar. 9, 1984, Ser. No. 587,799
Int. Cl.⁴ H01J *40/14*
U.S. Cl. 250—207 **8 Claims**



1. An imaging dynodes arrangement for an electron multiplier, comprising:

(a) a first imaging dynode having a first set of dynode cones with a cone tip and a cone base, the dynode cones of the first set being connected with each other such that they form free cavities therebetween;

(b) a second imaging dynode having a second set of dynode cones with a cone tip and a cone base, the dynode cones of the second set being connected with each other such that they form free cavities therebetween; and

(c) needle-shaped extraction points arranged at the cone tips of at least the dynode cones of the second set;

wherein the second imaging dynode is mounted beneath the first imaging dynode in a staggered position such that the cone tips of the dynode cones of the second set are seated beneath the cavities of the first imaging dynode, directing the needle-shaped extraction points towards the cavities.

4,649,269

DYNODES ARRANGEMENT FOR AN ELECTRON MULTIPLIER

Dennis E. Persyk, Barrington, Ill., assignor to Siemens Gammasonics, Inc., Des Plaines, Ill.

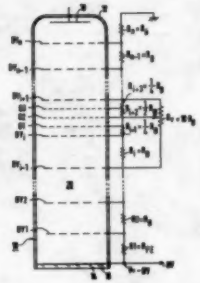
Filed Mar. 9, 1984, Ser. No. 587,800
Int. Cl.⁴ H01J *40/14*
U.S. Cl. 250—207 **8 Claims**

1. A dynodes arrangement for an electron multiplier, comprising:

(a) a first dynode having a first voltage input;

(b) a second dynode having a second voltage input;

(c) a control grid positioned between the first and second dynodes and having a control voltage input separate from the first and second voltage inputs of the first and second dynodes; and



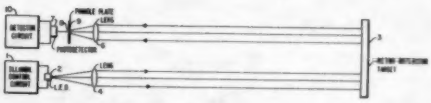
(d) at least one screen grid positioned between the first and second dynodes and the control grid, said screen grid having a screen grid voltage input.

4,649,270

PHOTO-ELECTRIC OBJECT DETECTOR HAVING REMOVABLE FIELD STOP MEANS

Louis Goldenberg, 22 Middlesex Cir., Waltham, Mass. 02154

Filed Dec. 10, 1984, Ser. No. 680,093
Int. Cl.⁴ G01V *9/04*; G06M *7/00*; H01J *40/14*
U.S. Cl. 250—221 **11 Claims**



1. Method of eliminating duplication of photo-electric control apparatus for functioning in a retro-reflective mode wherein detected light is reflected off of a retro-reflector and a proximity mode wherein detected light is reflected off of an object comprising the steps of:

a. providing a photoelectric control device having a light beam transmission means, including a light generator, for projecting a light beam on said retro-reflector, light detector means for producing a signal upon the reception of said light beam reflected off of said retro-reflector together with a readily removable field stop means positioned in front of said light detector for detecting light only from a narrow field of view including said retro-reflector;

b. manually positioning said field stop means in front of said detector for operation in said retro-reflector mode; and

c. manually removing said field stop means for operation in said proximity mode.

4,649,271

FIBER-OPTIC ACCELERATION SENSOR WITH PHOTOLUMINESCENT MATERIAL

Bertil Hök, and Lars Jonsson, both of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

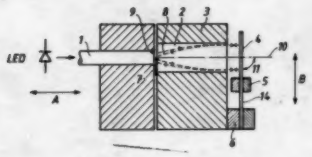
Filed Jan. 24, 1985, Ser. No. 694,326
Claims priority, application Sweden, Jan. 25, 1984, 8400366
Int. Cl.⁴ H01J *5/16*
U.S. Cl. 250—227 **21 Claims**

1. A fiber-optic sensor for sensing dynamic acceleration and arranged so that the acceleration gives rise to changes in an optical output signal, which changes are caused by a change in an angle between at least one body and the optical axis of at least one graded index lens, at least one optical fiber being

arranged to transmit optical energy to one end surface of the lens and to feed said optical output signal back from said end surface of the lens

wherein

the energy of said optical output signal reflected back into



the fiber is arranged to be dependent on the angle and essentially independent of the distance between the body and the lens, and the sensor includes at least one photoluminescent material arranged so that a photoluminescent signal constitutes a part of the optical output from the sensor.

4,649,272

KEY OPERATED LOCK MECHANISM WITH MIXED MECHANICAL AND ELECTRIC CONTROL

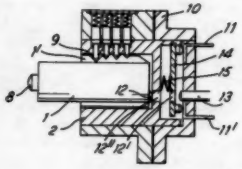
Paul Lipschutz, Croissy, France, assignor to Neiman S.A., Courbevoie, France

Filed Apr. 30, 1985, Ser. No. 728,907

Claims priority, application France, May 22, 1984, 84 07938

Int. Cl.[4] G01D 5/34

U.S. Cl. 250—229 **3 Claims**



1. In a key-operated vehicle lock mechanism including a bolt movable between locking and unlocking positions and an electro-mechanical drive operatively connected to said bolt, the provision of

a. a stator having a bore therein,

b. a rotor rotatable within said bore and having a recess therein,

c. a plurality of radial aligned openings in said rotor and stator,

d. a plurality of pairs of inner and outer piston means movable within said radial aligned openings in said rotor and stator, said inner and outer piston means being movable within said radial aligned openings between a rotor locked position where said inner and outer piston means prevent said rotor from moving relative to said stator and a rotor unlocked position wherein said rotor is movable with respect to said stator,

e. each of said inner piston means having an innermost end which is selectively receivable within said recess in said rotor,

f. a combination key and emitter means having a body formed with a series of notches, a signal emitter means disposed within said body for emitting coded signals outwardly from said body and along a predetermined axis, said notches being engageable by said innermost ends of said inner piston means when said combination key and emitter means is inserted within said rotor, a manually operable switch means on said body to control said signal emitter means,

g. signal receiver means mounted within said stator and being electrically connected to the electro-mechanical drive,

h. said rotor being movable from a first angular position wherein said signal receiver means is in a non-alignment with said predetermined axis along which said coded signals are emitted to a second angular position wherein said signal receiver means is aligned with said predetermined axis along which said coded signals are emitted, and

i. said manual switch means being selectively operable when said signal receiver means is aligned with said predetermined axis to generate a coded signal from said signal emitter means to said signal receiver means to thereby activate the electro-mechanical drive to move the bolt to its unlocked position.

4,649,273

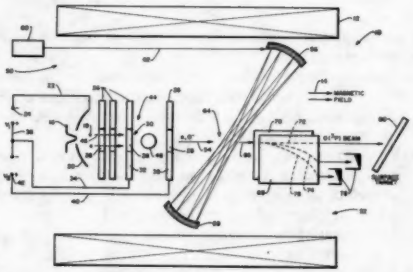
VARIABLE ENERGY, HIGH FLUX, GROUND-STATE ATOMIC OXYGEN SOURCE

Ara Chutjian, La Cresenta, and Otto J. Orient, Duarte, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 10, 1986, Ser. No. 852,468

Int. Cl.[4] H01S 1/00

U.S. Cl. 250—251 **36 Claims**



1. A variable energy, high flux, ground-state atomic oxygen source comprising:

(a) means for producing a high density beam of molecules which will emit O^- ions when bombarded with electrons;

(b) means for producing a high current stream of electrons at a low energy level of between 1 and 15 electron volts and for passing said stream of electrons through said high density beam of molecules to produce a stream of O^- ions;

(c) means for accelerating said O^- ions to a selected energy level between 3 and 100 electron volts;

(d) means for directing a multiple pass laser beam through said stream of O^- ions to strip off the excess electrons from a plurality of said O^- ions to produce ground-state O atoms within said stream;

(e) electrostatic deflection means for deflecting the path of said O^- ions and said electrons; and,

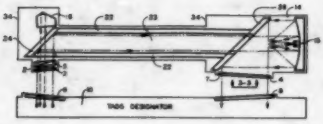
(f) means for stopping said O^- ions and said electrons and for allowing only said ground-state O atoms to continue as the source of the atoms of interest.

4,649,274

TEMPERATURE STABLE BORESIGHT MODULE

Rudolf Hartmann, Winter Park, Fla., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 22, 1985, Ser. No. 769,457
Int. Cl.[4] G02B *23/04*; G01M *11/00*
U.S. Cl. 250—341 **7 Claims**



1. In an optical boresight calibration device rendering parallel two lines-of-sight in each of two spectral regions, one line-of-sight being generated by retroreflection of radiation entering the device, and the other line-of-sight being generated by focusing a portion of said entering radiation on a transducer material in a collimator which converts the radiation to a different spectral region and re-emits it as a beam parallel to the retroreflected line-of-sight, means maintaining this parallelism despite thermal changes including: a zero-expansion glass ceramic polygonal spacer, equal in length to the separation between boresighting apertures and having 45 degree parallel end faces and longitudinal bore therein, forming an optical path therethrough from end face to end face; a dichroic beamsplitter plate; optical temperature nullifying means securing the beamsplitter plate to the first end face at a 45 degree angle to the entering radiation so that it transmits entering radiation into the polygonal spacer; a corner cube prism adapted to receive a portion of the incoming radiation from the beamsplitter plate for retroreflection, as the remaining portion of incoming radiation is reflected off the beamsplitter plate through the bore in the polygonal spacer; a reflective collimator adapted to focus onto a wavelength converting material the portion of incoming radiation thus reflected so that re-emitted, excited radiation fills an aperture of the collimator; an opaque, annular, elliptical mirror; optical temperature nullifying means securing the elliptical mirror to the second parallel face of the polygonal spacer so that it projects a beam of the excited radiation parallel to the retroreflected line-of-sight.

4,649,275

HIGH RESOLUTION BREAST IMAGING DEVICE UTILIZING NON-IONIZING RADIATION OF NARROW SPECTRAL BANDWIDTH

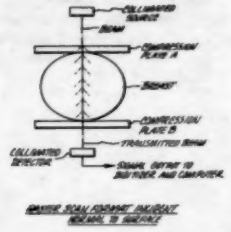
Robert S. Nelson, 1045 Ocean Ave., #18, Santa Monica, Calif. 90403, and Reuven D. Zach, 1425 Harper Ave., #5, Los Angeles, Calif. 90046

Filed Aug. 27, 1984, Ser. No. 624,467
Int. Cl.[4] G01N *21/27, 21/59*
U.S. Cl. 250—358.1 **31 Claims**

1. An apparatus for obtaining mammography images using non-ionizing radiation including:

a source of non-ionizing radiation of relatively narrow bandwidth disposed such that the radiation will be incident on a breast,

an optical detector disposed so as to detect the radiation after having passed through the breast, and



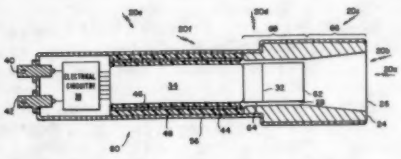
means for reducing the detected intensity of radiation scattered by the breast by disposing a collimator between the source of non-ionizing radiation and the optical detector.

4,649,276

HIGH-ENERGY RADIATION DETECTOR AND METHOD OF DETECTION

Arata Suzuki, Ramsey, N.J., assignor to Capintec, Inc., Ramsey, N.J.

Filed Mar. 13, 1985, Ser. No. 711,096
Int. Cl.[4] G01T *1/20*; G21F *3/00*
U.S. Cl. 250—361 R **9 Claims**



1. A high-energy radiation detector comprising:

means for detecting a predetermined type of high-energy radiation and transforming the detected radiation into light, said means for detecting having a first and second end;

means for generating an electric signal based upon the amount of light directed thereon and for outputting said signal;

an optical window means optically coupled to said first end of the detecting means for channeling the light therefrom into the generating means, said optical window being composed of material having a predetermined amount of heavy metal therein;

a collimator made of heavy metal disposed at said second end of said detecting means, said collimator having an open end to admit said high energy radiation onto said second end of said detecting means;

means for shielding composed of heavy metal and being exclusively limited to and covering said detecting means other than said first and second ends of said detecting means and limited to and covering portions of said optical window, and the weight of the radiation detector being minimized due to the limited extent of said shielding means; and

means for supporting said detecting means, said generating means, said optical window, said collimator and said shielding means;

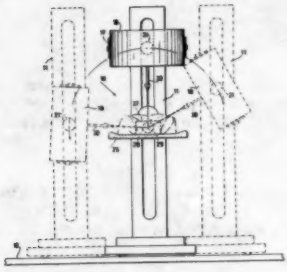
wherein said means for detecting is shielded from high-energy radiation on all sides by said optical window and said means for shielding except for said second end adjacent said collimator and the means for supporting does not shield high-energy radiation from components internal thereto.

4,649,277

MULTIPURPOSE APPARATUS FOR NORMAL OR TOMOGRAPHIC INVESTIGATIONS BY MEANS OF A GAMMA CAMERA

Luigi Terra, Milano; Edoardo Sada, Cernobbio, and Sergio Colombo, Milano, all of Italy, assignors to S.E.L.O. Societa Elettronica Lombarda S.p.A., Sesto San Giovanni, Italy

Filed Oct. 26, 1984, Ser. No. 665,069
Claims priority, application Italy, Oct. 27, 1983, 23481 A/83
Int. Cl.[4] G01T 1/166
U.S. Cl. 250—363 S 15 Claims



1. A multipurpose apparatus for normal or tomographic investigations with a gamma camera of a patient laying in a patient's bed, said apparatus comprising guides positioned parallel to the patient's bed in a horizontal plane, a vertically extensible column movable with respect to said horizontal plane, said column having means supporting a detector head for rotation about a horizontal support axis, said detector head being movable both according to the vertical extension of the head on said column and according to the rotation about said support axis, three separate drive means for three movements including a first drive means for adjusting said column horizontally on said guides, second drive means for vertically adjusting said detector head on said column, and third drive means for rotating said detector head about said support axis, a second bed, and control means for coordinating said three movements to provide movement of said detector head in a plane essentially determined by said guides and said column according to a curved trajectory described about said second bed, said second bed being perpendicular to said determined plane.

4,649,278

GENERATION OF INTENSE NEGATIVE ION BEAMS

Ara Chutjian, La Crescenta; Otto J. Orient, Duarte, and Samuel H. Aladzhadzhyan, Glendale, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

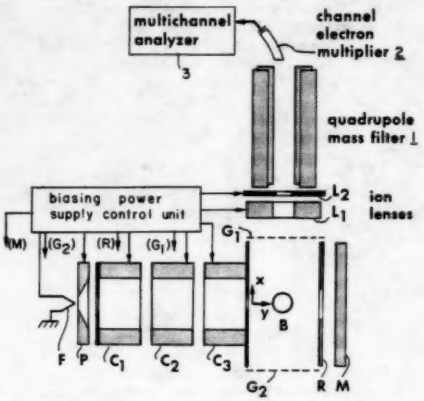
Filed May 2, 1985, Ser. No. 729,768
Int. Cl.[4] H01J 27/02
U.S. Cl. 250—423 R 12 Claims

1. A method for generating negative ions using a beam of electrons comprising the steps of:

producing an electric field in the path of said electron beam for reversal of said electron beam to produce at the turning point electrons having a distribution of energies centered at zero;

introducing a gas containing thermal electron-attaching molecules at a point in the path of said electron beam where said electrons have a low energy and a high probability for attachment to said molecules, thereby efficiently generating ions; and

directing said ions in a focused beam to a utilization device.

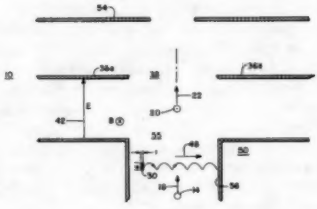


4,649,279

NEGATIVE ION SOURCE

James E. Delmore, Idaho Falls, Id., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 606,038, May 1, 1984, abandoned. This application Jan. 23, 1986, Ser. No. 821,202
Int. Cl.[4] H01J 27/20
U.S. Cl. 250—427 14 Claims



1. An apparatus for producing negative ions of a gaseous sample comprising:

an electron emitter;

a draw-out electrode lying in a first plane and having an axis extending perpendicular to said first plane;

a chamber having an ionization region and containing said electron emitter in said ionization region and containing said draw-out electrode removed from said ionization region;

means for providing at least between said electron emitter and said draw-out electrode, an electric field aligned with said axis of said draw-out electrode and oriented to attract negative particles toward said draw-out electrode;

means for providing in said ionization region of said chamber, a uniform magnetic field orthogonal to said electric field throughout said ionization region, such that when a gaseous sample is introduced into said ionization region of said chamber, and electrons are emitted from said electron emitter, said electrons accelerate toward said draw-out electrode under the influence of said electric field, said

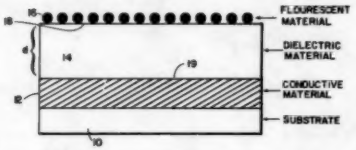
magnetic field causes said moving electrons to travel in a direction orthogonal to said magnetic and electric fields, with a generally cycloidal trajectory effected by said orthogonal electric and magnetic fields, molecules of said gaseous sample capture said cycloidally moving electrons to become negative ions which are preferentially accelerated by said electric field toward said draw-out electrode, free electrons not captured being retained in said ionization region.

4,649,280

METHOD AND SYSTEM FOR THE ENHANCEMENT OF FLUORESCENCE

William R. Holland, and Dennis G. Hall, both of Rochester, N.Y., assignors to The University of Rochester, Rochester, N.Y.

Filed May 10, 1985, Ser. No. 732,773
Int. Cl.[4] G01J *1/58*
U.S. Cl. 250—483.1 **23 Claims**



1. The method of enhancing the detection of fluorescence of a material which comprises the steps of providing with a film of said material a waveguide which supports propagation modes for optical radiation at the wavelength of the fluorescence from said material, exciting fluorescence from said film-/substrate waveguide and detecting said fluorescence from said film/substrate waveguide, wherein said waveguide is defined by a dielectric layer of predetermined thickness which maximizes the intensity of said fluoroescence, and films of said fluorescent material and conductive mateiral on opposite surfaces of said layer.

4,649,281

OIL CONTENT MONITOR/CONTROL SYSTEM

Ray F. Schmitt, Riviera Beach; Joseph A. Gavin, Glen Burnie; Francis D. Kempel, Sudlersville, all of Md., and Charles N. Waltrick, deceased, late of Glen Burnie, Md. (by Steven B. Waltrick, Cathy M. Waltrick, legal representatives), assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 2, 1985, Ser. No. 751,346
Int. Cl.[4] G01N *21/49*; B01D *17/04*; C02F *1/40*
U.S. Cl. 250—574 **4 Claims**

3. A system for processing oil-contaminated ship bilge water and discharging an effluent overboard only when the oil concentration is below a predetermined concentration, comprising:

means separating oil from the bilge water and expelling an effluent containing a reduced concentration of oil;

disperser means for uniformly distributing any oil still present in the expelled effluent into small droplets;

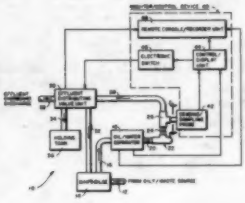
means repeatedly extracting samples of the expelled effluent having uniformly distributed oil droplets;

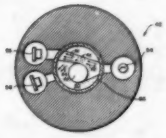
means passing light through the samples and measuring the ratio of light passed directly therethrough to light scattered by oil droplets therein;

means providing electrical signals corresponding to the light ratios;

an effluent distributing valve unit, and,

means processing the electrical signals for operating the distributing valve unit for directing overboard discharge of effluent when the oil concentration therein is below a





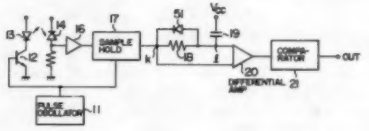
predetermined level and back into the ship's bilge when the oil concentration is above a predetermined level.

4,649,282

SMOKE SENSING APPARATUS OF THE LIGHT SCATTERING TYPE

Kazuomi Ota, Anjo; Minoru Kato, Ichinomiya; Seiichi Narita, Kariya, and Mitutoshi Moriya, Gamagori, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 5, 1985, Ser. No. 698,545
Claims priority, application Japan, Feb. 14, 1984, 59-26844
Int. Cl.[4] G08B *17/10*
U.S. Cl. 250—574 **19 Claims**



10. A smoke sensing apparatus, comprising:

means for emitting a predetermined light;

light receiving means, spaced from said light emitting means, for receiving light emitted by said light emitting means and producing an output signal indicative of an amount of said light received, said output signal varying based on an amount of smoke existing between said light emitting means and said light receiving means;

averaging means for averaging said output signal of said light receiving means, said averaging means including: (a) resistor means, having a first end coupled to said output signal of said light receiving means, for providing a resistive load, (b) means for storing charge, coupled between a power supply terminal and a second end of said resistor means, a junction point being formed between said second end of said resistor means and said means for storing charge, and (c) charge equalizing means, shunted in parallel across said resistor means, for selectively providing a low resistance parallel path across said resistance means when actuated into a low resistance mode for quickly altering the charge on said charge storing means, said charge equalizing means thereby selectively providing a low resistance path for charging and discharging said charge storage means; and

determining means, coupled to said output terminal of said

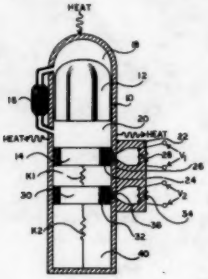
averaging means, for determining whether a smoke level exceeds a predetermined threshold based on said output signal, and for producing a control signal indicative thereof.

4,649,283

MULTI-PHASE LINEAR ALTERNATOR DRIVEN BY FREE-PISTON STIRLING ENGINE

David M. Berchowitz, and Robert W. Redlich, both of Athens, Ohio, assignors to Sunpower, Inc., Athens, Ohio

Filed Aug. 20, 1985, Ser. No. 767,438
Int. Cl.[4] H02K *33/00*
U.S. Cl. 290—1 R **11 Claims**



1. An improved AC electrical power generating source of the type wherein a free piston Stirling engine drive a linear alternator via a power piston, the linear alternator having a first armature coil member and a first magnetic flux source member magnetically linked to and relatively reciprocable with respect to the first coil member, one of said members being drivingly linked to the power piston of the engine, wherein the improvement provides multi-phase output power and comprises:

a body mounted for reciprocation and drivingly linked through a spring to be driven by the power piston, and a second armature coil member and a second, cooperating magnetic flux source member magnetically linked to and relatively reciprocatable with respect to the second coil member, one of said second members being drivingly linked to said body.

4,649,284

WINDMILL

Leu Hsech-Pen, P.O. Box 16-317, Taipei, Taiwan

Filed Feb. 7, 1985, Ser. No. 699,445
Int. Cl.[4] F03D *9/00*; F02P *9/04*
U.S. Cl. 290—55 **3 Claims**

1. A windmill comprising:

a supporting frame;

a plurality of vertical shaft portions coaxially connected in series to form an integrated vertical transmission shaft rotatably mounted in said supporting frame;

a plurality of fan blades each transversely pivotedly mounted on said vertical shaft portion;

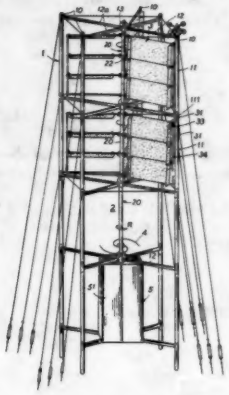
a sweeping cleaner fixed on the lower portion of said vertical transmission shaft;

a power generator having a set of gears for accelerating rotation speed as driven by said vertical transmission shaft and formed on the lower end of said transmission shaft; and

a high-speed braking clutch operatively braking the rotation of said transmission shaft and said power generator,

the improvement which comprises:

said fan blade formed with two bending edges respectively longitudinally protruding from the two vertical edges of said fan blade in a direction opposite to the rotation direction of said fan blade under wind pressure, and formed with a horizontal shaft having its inner end pivotedly mounted in a roller bearing within a horizontal bush of said vertical shaft portion and having its outer end pivotedly mounted in a vertical link suspen-



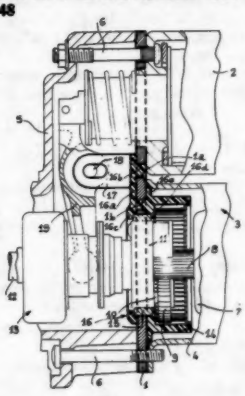
sively holding the horizontal shaft about said vertical shaft portion, said inner end of said horizontal shaft of said fan blade formed with a vertical rod thereunder to be operatively obstructed by a limiting rod transversely extending outwards from said horizontal bush of said vertical shaft portion when feathering said fan blade.

4,649,285

ELECTRIC STARTER INCORPORATING A BASE PLATE SUPPORTING THE CARCASE OF ITS ELECTRIC MOTOR AND THE YOKE OF ITS CONTACTOR

Alfred B. Mazzorana, Venissieux, and Francis Froment, Lyons, both of France, assignors to Societe Paris-Rhone, Lyons, France

Filed Nov. 7, 1984, Ser. No. 696,481
Claims priority, application France, Nov. 30, 1983, 83 19369
Int. Cl.[4] F02N *11/08*; H02P *9/04*
U.S. Cl. 290—48 **8 Claims**



1. An improved electric starter for an internal combustion engine wherein the starter includes an electric motor having a housing and having a motor shaft, and includes an actuator supported on a secondary shaft, and includes an electrical contactor coupled by a lever to the actuator and operative

when energized to displace the actuator on the secondary shaft to engage the starter, the improvements comprising:

(a) a base plate supporting the motor housing and the contactor, the base plate having a central bore aligned with the motor shaft;

(b) an epicycloidal reduction gear extending through said central bore and having a central pinion secured to the motor shaft, and having a satellite ring supported for rotation in bearing means and connected with said secondary shaft and the satellite ring supporting satellite gears meshing with said pinion, and having an internally-toothed fixed ring meshing with said satellite gears; and

(c) a plastic disc fixed to said base plate and extending through its central bore and supporting said bearing means aligned with the motor shaft, and the plastic disc carrying said internally-toothed ring aligned with said motor shaft and said bearing means.

4,649,286

POWER SUPPLY CIRCUIT FOR VEHICLE

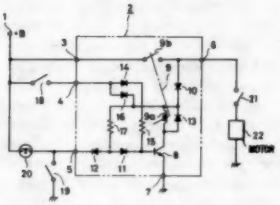
Nobuhiro Takeda, and Masaichi Hattori, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Jul. 27, 1984, Ser. No. 635,230

Claims priority, application Japan, Jul. 29, 1983, 58-119267[U]

Int. Cl.⁴ B60R *16/00*

U.S. Cl. 307—10 R **18 Claims**



1. A circuit for a motorized vehicle having an ignition switch connected to a power source, such as a battery, the circuit controlling the application of power from the power source to an electric device, such as a motor for driving an electric window or sun roof, comprising:

a relay having relay contacts and a driving coil, the relay contacts being connected between the power source and the electric device so as to apply power to said device upon energization of said driving coil;

door switch means coupled to the power source for detecting opening of a door of the vehicle; and

control means coupled to said ignition switch, to said door switch means and to said driving coil, for continuously energizing said driving coil in direct response to power being applied from the power source by the ignition switch and for de-energizing said driving coil in response to said door switch means detecting opening of a door of the vehicle.

4,649,287

BIDIRECTIONAL CONTROL SYSTEM FOR ENERGY FLOW IN SOLAR POWERED FLYWHEEL

Frank J. Nola, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 31, 1984, Ser. No. 636,459

Int. Cl.⁴ H02P *13/18*

U.S. Cl. 307—31 **6 Claims**

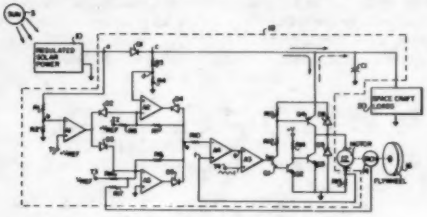
1. An energy supply system for a spacecraft for supplying energy to at least one spacecraft load, said system comprising:

a flywheel;

an electric motor connected to said flywheel for selectively supplying electrical power to the spacecraft load;

solar energy conversion means for receiving solar energy and for converting the received solar energy into an output voltage for supply to the spacecraft load; and

electrical control means for (1) sensing the spacecraft load voltage, and feeding back the sensed voltage to regulate the voltage supplied to the spacecraft load when the spacecraft load voltage changes, and for (2) comparing the output voltage from said solar energy conversion



means with a threshold voltage and, when said threshold voltage is exceeded, activating a speed control loop including said motor so as to accelerate the flywheel to a constant speed to thereby convert the electrical energy supplied from said solar energy conversion means into mechanical energy, and, when said threshold voltage is not exceeded, deactivating said speed control loop and activating a voltage control loop for controlling the amount of mechanical energy from said flywheel which is converted into an electrical energy output from said motor for supply to the spacecraft load in according with the sensed load voltage.

4,649,288

PRE-START WARNING SYSTEM AND MACHINE INCORPORATING SUCH SYSTEM

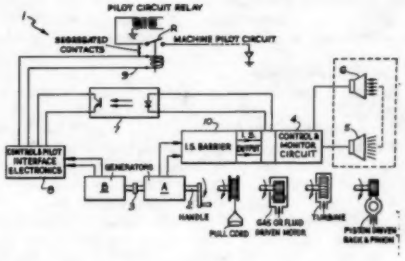
Michael J. Barry, Pontefract; Adrian Senior, Barnsley, and Alan E. Beech, Huddersfield, all of England, assignors to Dresser U.K. Limited, London, England

Continuation-in-part of Ser. No. 520,845, Aug. 5, 1983. This application Mar. 1, 1985, Ser. No. 707,455

Claims priority, application United Kingdom, Aug. 14, 1982, 8223441

Int. Cl.⁴ H02K *19/34*; E21C *35/04*

U.S. Cl. 307—84 **15 Claims**



1. A pre-start warning system for supplying electrical energy at an intrinsically safe level to an electrical machine, said system comprising two low speed generators mechanically coupled together, a drive shaft to rotate said generators and the mechanical input at said drive shaft producing a separate, isolated, electrical output at each of said generators, an intrinsically safe barrier means and first and second circuits, a pre-start

warning device incorporated in said first circuit, said output from a first one of said generators being fed to said intrinsically safe barrier means, whereby an intrinsically safe power supply is made available to power said first circuit and said pre-start warning device thereof, said output from a second one of said generators being fed to said second circuit which is a non-intrinsically safe circuit, and said barrier means incorporating an opto-coupled isolator constituted by a fibre-optic link between said intrinsically safe circuit and said non-intrinsically safe circuit, to achieve electrical and physical segretation of said first and second circuits, and said first circuit being a control and/or monitor circuit incorporating, as said pre-start warning device, an audible sounder, with an acoustic monitor to monitor the output of said sounder for a predetermined time period, after which period said control and/or monitor circuit is able to energise said intrinsically safe barrier means.

4,649,289

CIRCUIT FOR MAINTAINING THE POTENTIAL OF A NODE OF A MOS DYNAMIC CIRCUIT

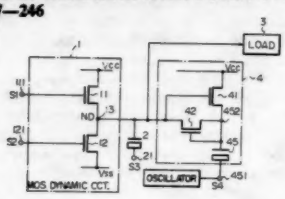
Tomio Nakano, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

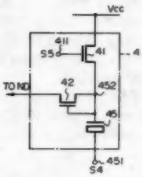
Continuation of Ser. No. 240,230, Mar. 3, 1981. This application Dec. 17, 1984, Ser. No. 682,586

Claims priority, application Japan, Mar. 3, 1980, 55-26447

Int. Cl.⁴ H03K *3/013, 3/353, 17/10, 17/687*

U.S. Cl. 307—246 **7 Claims**





1. A circuit for maintaining the potential of a node of a MOS dynamic circuit comprising a repetitive charging circuit operatively connected to said node, said repetitive charging circuit comprising:

a first connecting point;

first means, operatively connected to said first connecting point, for receiving a supply source voltage and repetitively charging said first connecting point while the potential of said node is higher than a predetermined potential, said first means comprising a MOS field effect transistor having a first electrode operatively connected to the supply source voltage point, a second electrode operatively connected to said first connecting point and a gate electrode operatively connected to said node; and

second means, operatively connected to said node and said first connecting point and operatively connected to receive a repetitive clock signal, for repetitively supplying a charging current to said node from the first connecting point in correspondence with the repetitive clock signal to maintain the potential of said node at a potential higher than the supply source voltage, said first means being responsive to the potential of said node and being cut off to stop charging while the potential of said node is lower than said predetermined potential irrespective of application of said repetitive clock signal.

4,649,290

PULSE GENERATING CIRCUIT

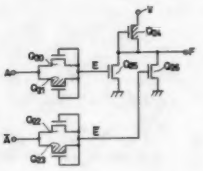
Makoto Yamamoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1985, Ser. No. 765,789

Claims priority, application Japan, Sep. 29, 1984, 59-205025

Int. Cl.⁴ H03K *3/353, 5/13*

U.S. Cl. 307—260 **6 Claims**



4. A pulse generating circuit comprising: first and second input terminals receiving an input signal and an input signal inverted, respectively; first and second input circuits, each of said input circuits comprising an enhancement/depletion transistor pair, a drain of each said enhancement-type transistor and each said depletion-type transistor being coupled commonly to a respective one of said input terminals, and gates and sources of said enhancement- and depletion-type transistors being coupled to a respective common source node; and an output circuit comprising a depletion-type transistor and two enhancement-type transistors connected in a NOR gate configuration with a common node point of said depletion-type transistor and said enhancement-type transistors of said output circuit being coupled to an output terminal, and gates of said enhancement-type transistors of said output circuit being coupled to respective ones of said source nodes.

4,649,291

VOLTAGE REFERENCE CIRCUIT FOR PROVIDING A PREDETERMINED VOLTAGE TO AN ACTIVE ELEMENT CIRCUIT

Satoshi Konishi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 23, 1984, Ser. No. 613,291

Claims priority, application Japan, May 26, 1983, 58-92644

Int. Cl.⁴ H03K *3/027, 3/353, 17/687;* **G11C** *7/00*

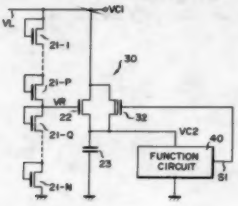
U.S. Cl. 307—297 **21 Claims**

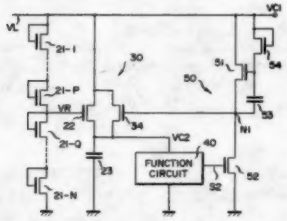
1. A semiconductor integrated circuit comprising:

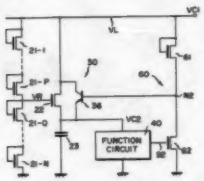
a function circuit having a plurality of active elements for performing a predetermined circuit function and generating at least one control signal, said function circuit being coupled between a node and a reference terminal and having at least two operating modes;

potential setting means, coupled between a power supply terminal and said node and controlled by said control signal from said function circuit, for setting the potential at said node to a predetermined value irrespective of said operating mode of said function circuit by varying a conductance between said power supply terminal and said

node in response to said control signal from said function circuit; and







capacitor means, coupled between said node and said reference terminal, for smoothing the potential at said node.

4,649,292

CMOS POWER-ON DETECTING CIRCUIT

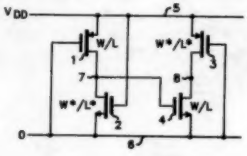
Andreas Ruszyak, Chene-Bougeries, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 6, 1985, Ser. No. 709,236

Claims priority, application United Kingdom, Mar. 14, 1984, 8406687

Int. Cl.⁴ H03K *17/30*

U.S. Cl. 307—362 **8 Claims**



1. A CMOS power-on detection circuit for providing an indication when the magnitude of an applied supply voltage exceeds the largest of the threshold voltages of its transistors, the circuit including first and second pairs of- comp-lementary-. MOS transistors each pair being coupled in series between first and second power supply lines, transistors of a first conductivity type having their source electrodes coupled to the first power supply line and transistors of a second conductivity type having their source electrodes coupled to the second power supply line, each pair of transistors including a relatively long and a relatively short channel transistor, the long channel transistor in the first pair being of different conductivity type to that of the long channel transistor of the second pair and the width-to-length ratio of each long channel transistor being large enough to ensure that for gate-source voltages greater than a predetermined value above its threshold voltage, its current is higher than the current in the short channel transistor of its pair for the same gate-source voltage, the short channel transistors of the first and second pairs and the long channel transistor of the first pair being biased to turn on with increasing value of the applied supply voltage, a first node formed between the transistors of the first pair being coupled to the gate electrode of the long channel transistor of the second pair, the said indication being provided by a predetermined potential change at a second node formed between the transistors of the second pair.

4,649,293

CLOCKED COMPARATOR

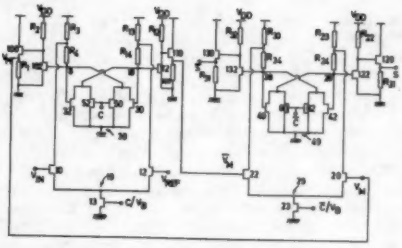
Thierry Ducourant, Crosne, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 31, 1985, Ser. No. 793,607

Claims priority, application France, Nov. 9, 1984, 84 17096

Int. Cl.⁴ H03K *5/153, 5/24;* H03M *1/36*

U.S. Cl. 307—362 **13 Claims**



1. A clocked voltage comparator formed by means of transistors which each have a control electrode, a first main electrode and a second main electrode, said comparator comprising:

a comparison stage for comparing an analog input voltage (V_{IN}) with an analog reference voltage (V_{REF}) and deriving an intermediate signal (V_M) and its complement ($V_{\overline{M}}$), which stage comprises two transistors coupled as a differential pair, the input voltage and the reference voltage being applied to respective control electrodes of said transistors, whose first main electrodes are connected to a common terminal for applying a bias current and whose second main electrodes are each coupled to a first d.c. supply terminal via a load and supply the intermediate signal and its complement respectively;

a latching stage coupled to the comparison stage for generating logic states in conformity with the output signals from the comparison stage, said latching stage comprising two transistors coupled together as a second differential pair forming a bistable latch, the signals received from branches of the comparison stage being applied to respective control electrodes of said latching-stage transistors, whose first main electrodes are connected to a common terminal and whose second main electrodes are cross-coupled to the control electrodes of the transistors of the second differential pair to form outputs of said latching stage, characterized in that:

the terminal to which the first differential pair is connected

is coupled to a second d.c. supply terminal via a current-source transistor,

the terminal to which the second differential pair is connected is directly connected to the potential on the second d.c. supply terminal,

the second differential pair is coupled to a third differential pair comprising two transistors coupled in parallel with the transistors of the second differential pair, and means for applying a clock signal to the control electrodes of the transistors of said third differential pair.

4,649,294

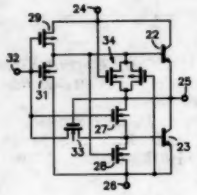
BIMOS LOGIC GATE

Kevin L. McLaughlin, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 13, 1986, Ser. No. 818,317

Int. Cl.[4] H03K *19/01, 19/082, 19/094*

U.S. Cl. 307—446 **12 Claims**



1. A circuit comprising:

a first supply voltage terminal;

a second supply voltage terminal;

an input terminal;

an output terminal;

a first bipolar transistor coupled between said first supply voltage terminal and said output terminal;

a second bipolar transistor coupled between said output terminal and said second supply voltage terminal;

first means coupled between said first and second supply voltage terminals and coupled to said input terminal and to a base of said first transistor for providing a voltage for biasing said first transistor, said first means providing a high impedance to said input terminal;

second means coupled between said output terminal and a base of said second bipolar transistor and coupled to said input terminal for biasing said second transistor; and

a transmission gate coupled between said base of said first bipolar transistor and said outpout terminal and having a first gate and a second gate coupled to said first and second supply voltage terminals, respectively.

4,649,295

BIMOS LOGIC GATE

Kevin L. McLaughlin, Chandler, and Walter C. Seelbach, Fountain Hills, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 13, 1986, Ser. No. 818,463

Int. Cl.[4] H03K *19/01, 19/082, 19/094*

U.S. Cl. 307—446 **8 Claims**

1. A circuit comprising:

a first supply voltage terminal;

a second supply voltage terminal;

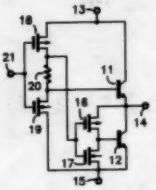
an input terminal;

an output terminal;

a first bipolar transistor coupled between said first supply voltage terminal and said output terminal;

a second bipolar transistor coupled between said output terminal and said second supply voltage terminal;

first means coupled between said first and second supply voltage terminals and coupled to said input terminal and said first transistor for providing a first voltage and a second voltage, said first transistor being biased by said second voltage, said first voltage being larger than said second voltage, said first means providing a high impedance to said input terminal; and



second means coupled between said output terminal and said second supply voltage terminal and coupled to said first means and said second bipolar transistor and responsive to said first voltage for biasing said second transistor.

4,649,296

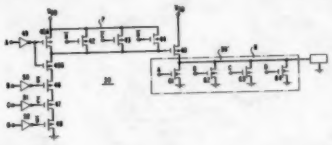
SYNTHETIC CMOS STATIC LOGIC GATES

Masakazu Shoji, Warren, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 13, 1984, Ser. No. 630,434

Int. Cl.[4] H03K *19/017, 19/094, 19/20*

U.S. Cl. 307—451 **5 Claims**



1. A CMOS logic gate arrangement having n separate inputs, said arrangement comprising an NFET pulldown segment and a PFET pull-up segment, said NFET pull-down segment comprising n NFETs whose source-drain paths are connected in parallel between an output node and a reference potential, each of said NFETs having its gate coupled to a separate one of the n inputs, said PFET pull-up segment comprising at least a first PFET element connected drainto-source between a source of supply voltage and said output node, said arrangement also comprising an auxiliary FET circuit arrangement for generating a control signal depending upon the inputs and for applying the control signal at least to the gate electrode of said first PFET element for pulling up said output node, the auxiliary FET circuit including an NFET portion comprising n NFETs and a PFET portion comprising n PFETs, at least one NFET of the auxiliary circuit having its gate electrode coupled through a separate inverter to a separate one of said n inputs, each PFET of the auxiliary circuit having its gate electrode coupled through a separate inverter to a separate one of said n inputs, and the control signal being generated at a node between the PFET portion and NFET portion of the auxiliary FET circuit.

4,649,297

TTL CIRCUITS GENERATING COMPLEMENTARY SIGNALS

Farhad Vazehgoo, South Portland, Me., assignor to Fairchild Semiconductor Corporation, Cupertino, Calif.

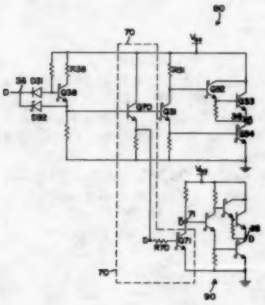
Filed Feb. 22, 1985, Ser. No. 704,375

Int. Cl.[4] H03K *19/088, 19/092, 17/60, 19/013*

U.S. Cl. 307—456 **21 Claims**

1. An improved enable gate for generating complementary enable signals E and A from an enable gate input signal $\overline{E}$, said

enable gate having pull-up and pull-down transistor elements operatively coupled to provide high and low level enable signals E at the enable gate output, phase splitter transistor element operatively coupled to control the states of the pull-up and pull-down transistor elements, and a first input transistor element for applying the enable gate input signal $\overline{E}$ to the base of the phase splitter, the improvement comprising:



an alternate enable transistor element coupled in emitter follower configuration in the enable gate with the base of the alternate enable transistor coupled to follow the enable gate input signal $\overline{E}$ and provide through the emitter circuit of the alternate enable transistor element an alternate enable signal A in phase with the enable gate input signal $\overline{E}$ and complementary to the enable signal E at the output of the enable gate.

4,649,298

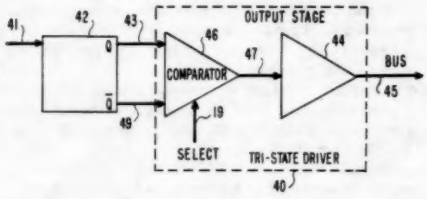
NON-SATURATING TRI-STATE DRIVER CIRCUIT

Frank P. Tuby, Jr., Montville, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 9, 1985, Ser. No. 689,951

Int. Cl.[4] H03K *19/013*

U.S. Cl. 307—473 **7 Claims**



1. An improved non-saturating tri-state driver circuit comprising a source of low voltage signals, a comparator and an output stage for delivering a tri-state signal all connected in cascade, wherein the improvement comprises

first and second means each connected between said source of low voltage signals and said comparator for delivering said low voltage signals and the complement of said low voltage signals from said source of low voltage signals to said comparator.

4,649,299

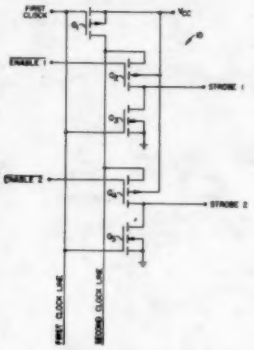
STROBE LINE DRIVER CIRCUIT

Roy K. Yamanouchi, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 16, 1984, Ser. No. 600,706

Int. Cl.[4] H03K *17/693*

U.S. Cl. 307—480 **9 Claims**



1. A strobe line driver circuit for generating a plurality of strobe signals in response to a corresponding plurality of enable signals and a first clock signal, said circuit comprising:

clock enable means, responsive to said first clock signal, for generating a second clock signal; and

a plurality of gate means for generating said strobe signals, wherein said first and second clock signals define the timing of said strobe signals, and wherein each of said gate means is coupled to receive a respective one of said enable signals, and is operable for generating one of said strobe signals in response to said one of said enable signals, each of said plurality of gate means including a first gate, coupled to receive said second clock signal, and operable for defining positive-going transitions of a strobe signal and a second gate, coupled to receive said first clock signal, and operable for defining negative-going transitions of said strobe signal.

4,649,300

BOOTSTRAP BUFFER

Joseph D. Schutz, Portland, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Aug. 12, 1985, Ser. No. 764,494

Int. Cl.[4] H03K *4/58, 17/687, 19/017, 17/04*

U.S. Cl. 307—482 **4 Claims**

1. An MOS bootstrap driver circuit for receiving an input signal and for providing a bootstrapped output signal comprising:

a first, second and third transistor coupled in series said input signal being coupled to the gate of one of said first and third transistors;

said bootstrapped output signal being present on one of said terminals of said second transistor;

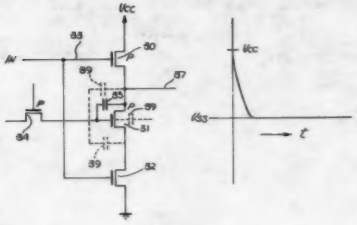
a first bootstrapping circuit for providing a bootstrapped potential;

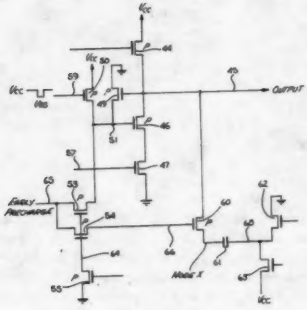
a fourth transistor coupled between said first bootstrapping circuit and said one terminal of said second transistor;

first capacitance means for providing electrical capacitance between said one of said terminals of said second transistor and the gate of said second transistor;

second capacitance means for providing electrical capaci-

tance between the gate of said fourth transistor and one of the terminals of said fourth transistor;





charging means for charging said first and second capacitance means prior to said input signal being applied to said circuit,

whereby said bootstrapped output signal is realized.

4,649,301

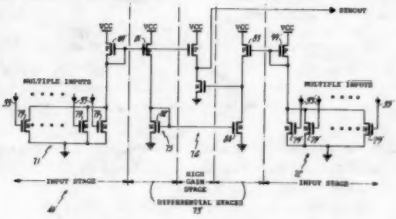
MULTIPLE-INPUT SENSE AMPLIFIER WITH TWO CMOS DIFFERENTIAL STAGES DRIVING A HIGH-GAIN STAGE

Hiep Van Tran, Carrollton, Tex., assignor to Thomson Components-Mostek Corp., Carrollton, Tex.

Filed Jan. 7, 1985, Ser. No. 689,251

Int. Cl.[4] H03K *5/24*; G11C *7/06*

U.S. Cl. 307—530 **5 Claims**



1. A multiple input sense amplifier arrangement, for a CMOS memory, comprising

a differential sense amplifier means (73') responsive to complementary input signals at its inputs provided by respective input stages (71, 72) receiving input signals (33) and complementary input signals (33'), wherein each of said respective input stages (71, 72) includes

a plurality of input-gate-driven n-channel MOS transistors (79, 79') corresponding to the number of multiple inputs to said sense amplifier arrangement, and

a p-channel MOS transistor (89', 99') connected at its source to a power supply potential (VCC) and connected at its drain and gate to an input transistor (81,83) of said differential sense amplifier means (73') and directly to the drains of said plurality of n-channel MOS transistors (79, 79').

4,649,302

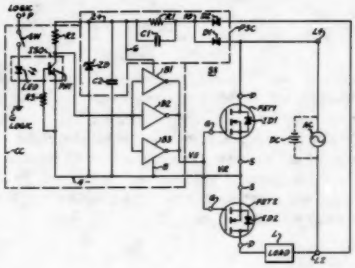
DC OR AC SOLID STATE SWITCH WITH IMPROVED LINE-DERIVED CONTROL CIRCUIT POWER SUPPLY

Michael A. Damiano, Germantown, and Richard F. Schmerda, Oak Creek, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 636,032, Jul. 30, 1984. This application Jun. 2, 1986, Ser. No. 870,661

Int. Cl.[4] H03K *17/687*

U.S. Cl. 307—584 **7 Claims**



1. A solid state switch having an improved line-derived control circuit power supply and being operable to control either a D.C. or A.C. load supplied from a respective D.C. or A.C. electrical power supply source comprising:

a pair of power supply terminals to which either said D.C. or A.C. electrical power supply source is connected;

a pair of solid state switching means connected in series with each other and said power supply terminals and said D.C. or A.C. load and being opposed with respect to one another so as to be operable to control current flow from said source to said load in positive and negative directions, respectively, on A.C. and in said positive direction on D.C. and each said solid state switching means comprising unidirectional current conducting means in parallel therewith for passing the current controlled by the other solid state switching means;

a common control circuit for said pair of solid state switching means supplied from said source for applying turn-on signals simultaneously to the same to control current flow from said source to said load;

external selectively controllable on-off logic signal input means for operating said common control circuit;

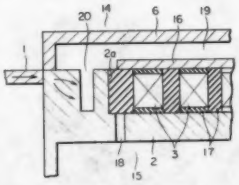
and a power supply circuit for said common control circuit connected to and supplied from said power supply terminals and including means connecting said power supply terminals and said unidirectional current conducting means of one of said solid state switching means in series to said common control circuit exclusive of said load and the other solid state switching means thereby to avoid leakage current in the load during at least alternate half-cycles of the source voltage;

said power supply circuit comprising a diode-isolated, capacitive-reactively coupled voltage dropping line power supply to said common control circuit.

4,649,303
ROTOR FOR A SUPERCONDUCTING ROTATING ELECTRIC MACHINE

Toshiki Hirao, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 10, 1986, Ser. No. 819,294
Claims priority, application Japan, Feb. 26, 1985, 60-39575
Int. Cl.[4] H02K 9/00, 3/24
U.S. Cl. 310—52 7 Claims

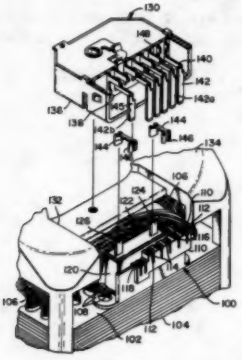


1. An improved rotor for a superconducting rotating electric machine of the type having a coil-carrying shaft with an outer peripheral surface comprising: torque tubes connected to opposite ends of said coil-carrying shaft, superconducting field coils housed in a recess provided in said coil-carrying shaft, a helium-sealing outer tube surrounding said coil-carrying shaft to form a sealed space for liquid helium between the outer surface of said coil-carrying shaft and an inner surface of said helium-sealing outer tube, and a circumferentially-extending groove provided on said coil-carrying shaft and extending inwardly from the outer peripheral surface to intersect a heat path along said shaft between the recess for said superconducting field coils and one of said torque tubes, the groove having an effect of substantially the same depth as the recess, to prevent heat conducted along said path from the one of said torque tubes from reaching said field coils, the radially outer end of said groove opening into said space to provide communication between liquid helium in the space and in said groove.

4,649,304
INTERCONNECTION SYSTEM FOR ELECTRICAL MOTORS

Charles G. Atherton, Mechanicsburg, and John C. Swartz, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 13, 1985, Ser. No. 797,726
Int. Cl.[4] H02K 11/00
U.S. Cl. 310—71 12 Claims



1. An electric motor assembly comprising a stator core, at least two coil windings on the core, a motor protector, and a switch, the coil windings having at least four winding ends which extend from the coil windings, the protector comprising a protector body having first and second protector terminals, the switch comprising a switch housing having at least three switch terminals, at least one winding end being connected to the first protector terminal, the second protector terminal being connected to one of the switch terminals, at least two winding ends being individually connected to other switch terminals, the assembly being characterized in that:

a multicontact electrical connector is provided, the connector comprising an insulating connector housing having a first terminal-receiving cavity and at least two additional terminal-receiving cavities therein, the cavities extending into the housing surface and each having an entrance portion which is proximate to the housing surface,

the first cavity having a first connector terminal inserted therein, each additional cavity having an additional connector terminal inserted therein, the first connector terminal and each of the additional connector terminals having a wire-connecting portion and a matable contact portion which is matable with a complementary matable contact portion,

the protector terminals and the switch terminals extending from the protector body and the switch housing respectively, and being sheet metal terminals having complementary matable contact portions,

the protector body, the switch housing, and the connector housing being adjacent to each other in a cluster which is adjacent to the stator core,

at least one winding end extending to the first cavity and connected to the wire-connecting portion of the first connector terminal, at least two winding ends extending to at least two additional cavities and connected to the wire-connecting portions of two additional connector terminals therein,

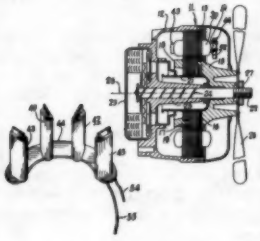
the first protector terminal extending to the first cavity and having its complementary matable contact portion mated with the matable contact portion of the first connector terminal, at least two of the other switch terminals extending to at least two of the additional cavities and having their complementary matable contact portions mated with the matable contact portions of the additional connector terminals in the additional cavities, and

a conductor extending between, and connecting, the second protector terminal and the one switch terminal.

4,649,305
CAPACITOR BETWEEN MOTOR WINDINGS

Wayne J. Morrill, King & Hamsher Sts., Garrett, Ind. 45738

Filed Feb. 6, 1986, Ser. No. 826,686
Int. Cl.[4] H01G 1/40; H02K 11/00; H02P 1/44
U.S. Cl. 310—72 18 Claims



1. A capacitor motor comprising, in combination:

a magnetically permeable stator;

said stator having a plurality of salient teeth establishing a plurality of pole faces on the stator;

a rotor journaled relative to said stator and magnetically cooperating with said pole faces across an air gap;

a stator winding having a plurality of coils on said salient teeth;

said coils and teeth having a width in the peripheral direction less than the width of the respective pole face to define a plurality of spaces between at least some of the adjacent coils;

at least one elongated capacitor disposed in one of said spaces; and

means connecting said capacitor to said stator winding.

4,649,306

DIRECT DRIVE MOTOR HAVING ADJUSTABLE BEARING FOR SPINDLE

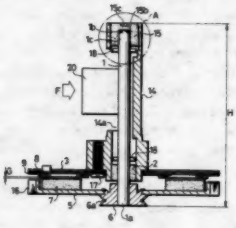
Tatsumaro Yamashita, Funaokasi, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Oct. 8, 1985, Ser. No. 785,525

Claims priority, application Japan, Oct. 8, 1984, 59-152177[U]

Int. Cl.⁴ H02K *5/16*

U.S. Cl. 310—90 **2 Claims**



1. In a direct drive motor comprising a base, an upright housing mounted on said base and provided with upper and lower bearings at its upper and lower ends, a capstan spindle rotatably mounted in said housing having upper and lower end portions fitted in said upper and lower bearings, respectively, said upright housing having an opening intermediate its ends for exposing said capstan spindle such that a pinch roller can be moved displaceably into contact with said capstan spindle at an operational position for driving a tape interposed therebetween, a rotor fixed to the lower end portion of said capstan spindle and having a plurality of magnets thereon, and a plurality of coils mounted on an underside of said base opposite to said magnets for driving said rotor when an electric current is applied to said coils,

the improvement wherein said upper bearing is formed as a screw member having external threads on a peripheral surface thereof and a recess defined in its bottom for receiving the upper end portion of said capstan spindle smoothly rotatably therein, said upper end of said housing having an internally threaded hole for receiving said threaded upper bearing therein, and said threaded hole of said upper end of said housing having a small eccentric spacing offset from an axis coincident with the operational position of said capstan spindle in driving contact with said pinch roller,

whereby said threaded upper bearing is threadably adjustable in an axial thrust direction of said capstan spindle, and at the same time provides a radial thrust bearing function when said capstan spindle is in driving contact with said pinch roller and said threaded upper bearing holding said capstan spindle is pressed frictionally against the threading of said hole at the operational position.

4,649,307

INDUCTION-TYPE PLANETARY REDUCING COUPLING FOR VERY HIGH SPEED ROTATING MACHINES

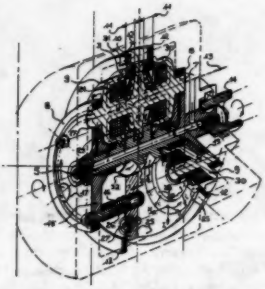
Jean A. Bech, 391, rue d'Endoume, 13007 Marseille, France

Filed Apr. 4, 1985, Ser. No. 719,878

Claims priority, application France, Apr. 12, 1984, 84 05954

Int. Cl.⁴ H02K *7/00, 49/02*

U.S. Cl. 310—99 **11 Claims**



1. A speed reducing coupling of the induction type for very high speed rotating machines, wherein the gear teeth of the mechanical planetary reduction gear train are replaced by an electromagnetic induction field and mechanical bearing means comprising a driving rotor having at least one collar, planet wheels to carry a magnetic field generating induced currents therein and which react with said induction field and bring about, with a certain amount of slipping, the rotational entrainment of said planet wheels and further comprising circular tracks arranged concentrically around said driving rotor, said wheels wheels being made to roll without slippage along said circular tracks via bearing hubs applied thereto by centrifugal force, and wherein said resulting motion is picked up by pole flanges of a planet wheel cage and transmitted to the output shaft attached thereto, thus providing speed reduction in an effective ratio equal to the theoretical ratio augmented by the required slipping allowance.

4,649,308

ELECTRIC MOTOR TEMPLATE-WOUND COIL

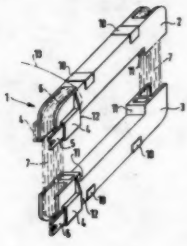
Ernst Krianzler, Leinfelden-Echterdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 22, 1985, Ser. No. 726,221

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1984, 3426706

Int. Cl.⁴ H02K *3/48*

U.S. Cl. 310—214 **10 Claims**



1. A template-wound coil for an electric motor and insertable into a pole shoe of the electric motor and comprising a

winding having a plurality of turns; and two hollow box-like cases of insulating material positioned opposite to each other, said turns of the winding having opposing elongated portions inserted into and closed by said cases, said cases having pockets formed thereon for receiving contact terminals of the coil.

4,649,309

CONNECTION ARRANGEMENT FOR ARMATURE CONDUCTORS WITH COMMUTATOR SEGMENTS, AND CONNECTING MACHINE

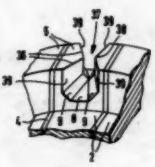
Werner Bode, Hildesheim; Peter Franz, and Heinrich Wilke, both of Diekholzen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 6, 1984, Ser. No. 637,764

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1983, 3328527

Int. Cl.⁴ H02K *13/04*

U.S. Cl. 310—234 **18 Claims**



1. In an armature (**1**) having armature conductors (**10, 11, 17**), an armature shaft (**16**) and a commutator (**1**), said commutator having a plurality of commutator segments (**2**) circumferentially located about the armature shaft and secured thereto,

an armature conductor—commutator connection arrangement,

in which the commutator segments (**2**) each have a radially projecting connecting tab or lug (**5**), said lug being formed with a slot (**6, 37**) in which an end portion of at least one armature conductor (**10, 11**) is located,

wherein, in accordance with the invention,

the side walls defining said slots are formed with at least one deviation (**7, 38, 39**) with respect to a plane which is at least approximately parallel to a plane passing through the longitudinal axis of the commutator and the center line of the slot;

said at least one deviation (**7, 38, 39**) extends radially with respect to said shaft from a region adjacent a bottom or root (**8**) of the slot up to essentially the outer circumference of the commutator; and

wherein the end portion of an armature conductor (**10, 11**) positioned in the slot is formed with a surface distortion interfitting with said deviation of the side wall of the slot to form, in combination with said deviation, an interfitting projection-and-recess connection.

4,649,310

PIEZOELECTRIC VIBRATING ELEMENT

Takeshi Nakamura, Uji; Ikuo Matsumoto, Nagaokakyo, and Kenji Ando, Kawasaki, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Dec. 24, 1984, Ser. No. 685,328

Claims priority, application Japan, Dec. 26, 1983, 58-248826

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—321 **30 Claims**

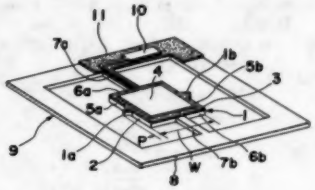
1. An expansion mode vibrating element comprising:

a substrate made of a constant modulus alloy having a plate shape which is symmetrical along a line extending across the substrate;

first and second sets of N projections extending from respective opposite sides of said substrate symmetrically with respect to said line, N being an integer greater than zero;

a thin piezoelectric film deposited on said substrate; and

a vibration electrode film deposited on said piezoelectric film, wherein the vibration frequency of said vibrating element may be adjusted by trimming said projections;



wherein the ratio P/W of the length of said projections to the width of said substrate between said projections is about 0–20 percent.

4,649,311

VIBRATION WAVE MOTOR

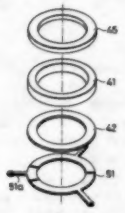
Hitoshi Mukohjima, and Akira Hiramatsu, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1985, Ser. No. 715,412

Claims priority, application Japan, Apr. 2, 1984, 59-65401; Oct. 30, 1984, 59-228379

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—323 **26 Claims**



12. A vibration wave motor comprising:

(a) a motor case;

(b) a vibration member including an electro-mechanical converting element, said vibration member being arranged so as to generate a travelling vibration wave in response to an AC voltage supplied to said vibration member; and

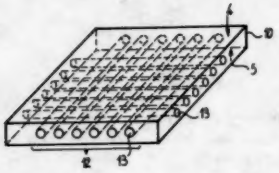
(c) a support member for supporting said vibration member, said support member having a plurality of auxiliary vibration members, each said auxiliary vibration member being fixed between said motor case and said support member, wherein said support member and said vibration member are not integral.

4,649,312

REINFORCED PIEZOELECTRIC TRANSDUCER AND PRESSURE SENSOR USING SUCH A TRANSDUCER

Philippe Robin, Sceaux; Francois Micheron, Gif sur Yvette; Patrick Petit, Villejuif, and Dominique Broussoux, Marcoussis, all of France, assignors to Thomson-CSF, Paris, France

Filed Jul. 15, 1985, Ser. No. 755,094
Claims priority, application France, Jul. 13, 1984, 84 11181
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—330 14 Claims



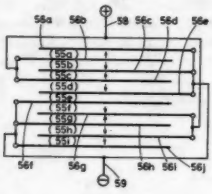
1. A piezoelectric transducer having a polarized piezoelectric material film, also comprising at least one porous reinforcing material incorporated into the mass of the film and preventing any deformation of the latter in certain given directions.

4,649,313

PIEZOELECTRIC DISPLACEMENT ELEMENT

Toshio Ogawa, Kyoto; Satoru Fujishima, Muko, and Akira Ando, Takatsuki, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Sep. 19, 1984, Ser. No. 651,995
Claims priority, application Japan, Sep. 22, 1983, 58-175869
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—358 9 Claims



1. A monolithic piezoelectric displacement element comprising:

a sintered body including ceramic material comprised in at least three ceramic layers and internal electrodes interposed between said ceramic layers, said sintered body being formed by stacking said at least three ceramic layers with a respective group of at least one said internal electrode being located between each adjacent pair of ceramic layers and then simultaneously firing the ceramic layers and electrodes together, said ceramic layers being coextensive with one another and having coextensive longitudinal edges, said internal electrodes extending to and alongside the major portion of said longitudinal edges:

said sintered body having first, second and third regions when viewed in a thickness direction of said displacement element;

said ceramic material in said first and third regions being conditioned to be displaced in reverse directions to each other when appropriate electrical potentials are applied to internal electrodes of said first and third regions; and

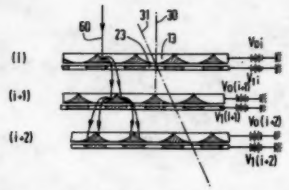
buffer means, comprising said ceramic material in said second region which is located between said first and third regions and which is characterized in that displacement of said second region is significantly smaller than displacement of said first and third regions, said buffer means being instrumental for alleviating a stress concentration in said second region in a manner that reduces a displacement hysteresis associated with said piezoelectric displacement element.

4,649,314

ELECTRON MULTIPLIER ELEMENT, ELECTRON MULTIPLIER DEVICE COMPRISING SAID MULTIPLYING ELEMENT, AND THE APPLICATION TO A PHOTOMULTIPLIER TUBE

Gilbert Eschard, Brive, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 9, 1984, Ser. No. 628,704
Claims priority, application France, Jul. 11, 1983, 83 11514
Int. Cl.[4] H01J *43/00*
U.S. Cl. 313—103 CM 11 Claims



1. An electron multiplier element of the apertured plate type, comprising

a first secondary emission plate having front and rear major surfaces as considered in the direction of electron propagation, and through multiplier holes each having an input and an output end which respectively open into said front and rear major surfaces, said input end having a cross-sectional area that is larger than the cross-sectional area of said output end, and said input ends being distributed in a regular flat pattern substantially tangent to one another, said output ends being distributed in a like regular flat pattern which is shifted from the pattern of said input ends,

a second plate parallel to said first plate and having first and second major surfaces as considered in the direction of electron propagation, and through auxiliary holes each having a first and a second end which respectively open onto said front and rear major surfaces, said first end being aligned with said output end and having a cross-sectional area that is substantially equal to that of said output end and smaller than the cross-sectional area of said second end, and

means directly interposed between said rear and first surfaces for electrically insulating said first and second plates from one another,

whereby upon application to said first plate of a first electric potential and to said second plate of a second electric potential which exceeds said first electric potential, electrons incident upon said first plate input ends are multiplied and pass through said auxiliary holes.

4,649,315

CATHODE-RAY TUBE SOCKET

Hirofumi Inaba, Yao, and Yasumasa Watanabe, Neyagawa, both of Japan, assignors to Hosiden Electronics Co., Ltd., Osaka, Japan

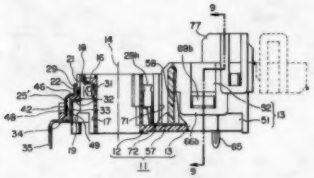
Filed Feb. 19, 1985, Ser. No. 702,759
Claims priority, application Japan, Aug. 8, 1984, 59-122211[U]
Int. Cl.[4] H01J *17/00, 21/00*
U.S. Cl. 313—325 13 Claims

1. A cathod-ray tube socket comprising:

(a) a disc-shaped main body portion fabricated of an insulat-

ing material, said main body portion defining a plurality of contact housing therein at equal angular intervals along a circle concentric with a center axis of said main body portion, a cylindrical side wall portion defining radially outer side wall portions of respective ones of said contact housings in parallel to said center axis, a circular front face wall formed at a front end of said cylindrical side wall portion integrally therewith, said circular front face wall having a plurality of terminal pin insertion holes extending therethrough into communication with corresponding ones of said contact housing, a plurality of discharge gap holes extending through respective ones of said outer side wall portions to communicates said contact housing with the outside of said cathode-ray tube socket, first positioning grooves defined on inner surfaces of said outer side wall portions adjacent said discharge gap holes to extend in parallel to said center axis, and second positioning grooves defined on outer surfaces of said outer side wall portions adjacent said discharge gap holes to extend in parallel to said center axis in opposing relation to said first positioning grooves;

(b) a plurality of contact pieces accommodated respectively in said contact housing, each of said contact pieces being



fabricated of a metal strip which is shaped to define a contact portion for resiliently contacting a terminal pin of a cathode-ray tube, a terminal portion integral with said contact portion and projecting out of said main body portion, and an intermediate portion which connects said contact portion to said terminal portion and which is force-fitted into and held in a corresponding one of said first positioning grooves in parallel to said center axis to serve as a first discharge electrodes portion; and

(c) a grounding conductor fabricated of a metal strip which is disposed substantially arcuately around said central axis and mounted on said main body portion, said grounding conductor having a plurality of integral second discharge electrodes portions that are force-fitted into and positioned in said second positioning grooves in confronting relation to said first discharge electrode portions, respectively, to define discharge gaps between said first and second discharge electrode portions, said first and second discharge electrode portions and the inner wall surfaces of said discharge gaps holes jointly defining discharge gap chambers which contain said discharge gaps therein and are isolated from the exterior of said cathode-ray tube socket.

4,649,316

ION BEAM SPECIES FILTER AND BLANKER

John R. A. Cleaver, and Haroon Ahmed, both of Cambridge, England, assignors to Dubilier Scientific Limited, Abingdon, England

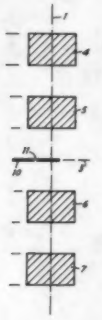
Filed Sep. 19, 1983, Ser. No. 533,493

Claims priority, application United Kingdom, Sep. 17, 1982, 8226636

Int. Cl.⁴ H01J *49/20*

U.S. Cl. 313—361.1 **8 Claims**

1. An ion beam apparatus comprising: a generating means for generating an ion beam centered about an axis; a first and a second magnetic deflection means for deflecting said ion beam to a focal point displaced from said axis by an amount dependent upon the charge-to-mass ratio of the ions contained within said ion beam; a screening plate orientated in a lateral direction with respect to said axis, said screening plate having an off-axis aperture formed therein at a location wherein only ions within said ion beam which are of a predetermined selected ion species pass through said aperture and wherein ions of the remaining other ion species impinge on said plate and are absorbed by said plate; a third and a fourth magnetic deflection means arranged so as to have an equal and opposite effect to said first and second deflection means for deflecting said ion beam back to a position centered about said axis;



wherein the symmetrical effect of said apparatus causes the divergence of said ion beam due to energy spread to be reversed after passing through an aperture plane thereof such that when said ion beam emerges from said third and fourth deflection means, said ion beam is parallel in all respects, and wherein said ion beam apparatus separates ions on the basis of their charge-to-mass ratio without eliminating ions having the same charge-to-mass ratio but having different energy levels.

4,649,317

MULTIBEAM ELECTRON GUN HAVING MEANS FOR SUPPORTING A SCREEN GRID ELECTRODE RELATIVE TO A MAIN FOCUSING LENS

Stephen T. Opresko, Manor Township, Lancaster County, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 27, 1985, Ser. No. 769,970

Int. Cl.⁴ H01J *29/50, 29/82*

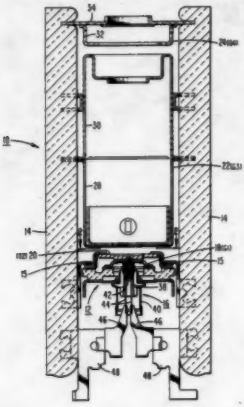
U.S. Cl. 313—414 **3 Claims**

1. In a multibeam electron gun for a cathode-ray tube comprising a modular beam-forming region assembly and a main focusing lens which are affixed to at least two insulative support rods, said beam-forming region assembly including a plurality of cathode assemblies, a control grid electrode and a screen grid electrode, said electrodes having aligned apertures therethrough for passage of a plurality of electron beams from said cathode assemblies, said cathode assemblies and said electrodes being individually held in position from a common ceramic member having a first and a second major surface with a metallized pattern formed on at least a portion of each major surface, said electrodes being attached to said first major surface and said cathode assemblies being attached to said second major surface, wherein the improvement comprises

a transition member disposed between said metallized pattern on said first major surface of said ceramic member and said screen grid electrode, said transition member including a substantially flat portion attached to said metallized pattern and two upright portions substantially perpendicular to said flat portion and substantially parallel to each other,

said screen grid electrode having at least one plate-like member disposed between said upright portions of said transition member, and

a plurality of step-like support members interconnecting said screen grid electrode to said upright portions of said transition member, each of said step-like support members having a screen grid electrode contact portion, a bead support contact portion and a central riser portion extending between said aforementioned contact portions, said screen grid electrode contact portion of each of said step-like support members being attached to said screen grid



electrode and said central riser portion of each of said step-like support members being attached to said upright portions of said transition member in longitudinal spaced relation to said control grid electrode, said bead support contact portion of each step-like support member being attached to a different one of a plurality of bead support members affixed to said insulative support rods, whereby said screen grid electrode is longitudinally spaced from said main focusing lens.

4,649,318

ELECTRON GUN WITH LOW SPHERICAL ABERRATION

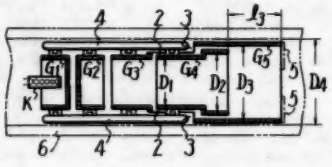
Masahiro Kikuchi; Yuzuru Kobori, and Kanemitsu Murakami, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 469,290, Feb. 24, 1983, abandoned. This application Sep. 23, 1985, Ser. No. 778,769

Claims priority, application Japan, Feb. 26, 1982, 57-31351; Sep. 25, 1982, 57-167319

Int. Cl.[4] H01J *29/46, 29/56*

U.S. Cl. 313—449 **5 Claims**



1. A unipotential type electron gun comprising a main electron lens system having a first electron lens system and a second electron lens system of which the electron lens operative regions are separated from each other, said first system being formed of a third grid and a fourth grid, said second system being formed of said fourth grid and a fifth grid, the aperture diameter of aid fifth grid being larger than that of said fourth grid, and the aperture diameter of said fourth grid facing said fifth grid being larger than that of said fourth grid facing said third grid, wherein said third grid and said fifth grid are mechanically and electrically united into an unitary structure, wherein at least one window portion is formed in said unitary structure, and wherein said fourth grid is arranged within said unitary structure and wherein said fourth grid is held by means of at least one insulating holder through said window portion, which holder also holds first, second and said third grids and a shield plate attached to the front end of said fifth grid and $l_3/D_3 \geqq 0.57$ where D_3 is the diameter of the fifth grid and l_3 is the distance from said shield plate to the front edge of said fourth grid.

4,649,319

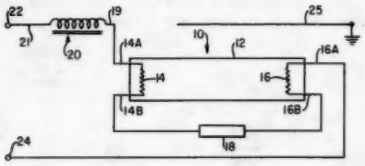
GAS DISCHARGE LAMP STARTER

Joel Shurgan, Westwood, N.J., assignor to Duro-Test Corporation, N.J.

Filed Oct. 3, 1984, Ser. No. 657,414

Int. Cl.[4] H05B *39/00*

U.S. Cl. 315—99 **3 Claims**



1. A device for starting a discharge lamp having first and second filament electrodes at one end and third and fourth electrodes at another end mounted in a sealed envelope adapted to be located proximate to an electrical ground, said lamp being operated at a predetermined operating voltage, comprising:

first and second terminals adapted to receive alternating current voltage, said fourth electrode directly connected to said second terminal;

a ballast choke directly connected between said first electrode and said first terminal; and

a two terminal having a pair of terminals directly connected between said second electrode and said third electrode, for conducting current when the instantaneous value of said AC voltage exceeds a first value more than said lamp operation voltage, and having a breakover voltage characteristic selected to cause it to cease to conduct current when said instantaneous AC voltage falls below a second value at a time when the current flowing through said choke is rapidly changing in amplitude, for generating a relatively high amplitude pulse in each half-cycle of said alternating current voltage, thereby providing flickerless starting of said lamp, whereby once the lamp is lit, the voltage drop across said lamp is below the breakover voltage of said semiconductor bilateral switch, maintaining the latter non-conductive.

4,649,320

THERMAL PROTECTOR FOR CIRCULAR FLUORESCENT LAMP ASSEMBLY

Harold L. Hough, Beverly, and Robert P. Bonazoli, Hamilton, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jun. 18, 1984, Ser. No. 621,636

Int. Cl.[4] H05B *39/04*

U.S. Cl. 315—100 **25 Claims**

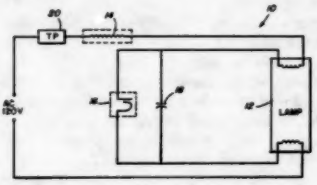
1. An electric circuit for use with an electric lamp having a pair of cathodes, said electric circuit comprising:

lamp starting switch means;

capacitance means coupled in parallel with said lamp start-

ing switch means, said lamp starting switch means and said capacitance means adapted for being coupled in a shunt fashion with said cathodes of said electric lamp;

ballast means adapted for being coupled in series with said electric lamp; and



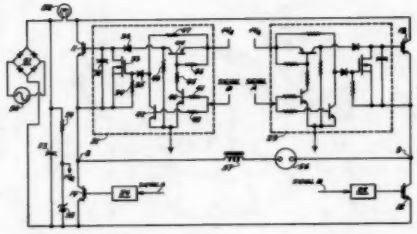
means for preventing ballast means overheating and for extending the operating life of said lamp starting switch means electrically coupled in series with said ballast means, starting switch means, capacitance means and electric lamp.

4,649,321

GATE CAPACITANCE LATCH FOR DC TO AC CONVERTERS

Angelo Ferraro, Stillwater, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 28, 1985, Ser. No. 791,823
Int. Cl.[4] H05B *41/29*; H02M *7/5387*
U.S. Cl. 315—224 **9 Claims**



1. A DC to AC converter adapted to be connected to a DC supply for providing a DV voltage between a reference rail and a non-reference rail, said converter comprising:

a current-limiting impedance having one end adapted to be connected to one of said rails;

a first converter leg connected to the other end of said impedance and adapted to be connected to the other of said rails, said first leg being comprised of a series-connected pair of upper and lower semiconductor switching devices forming a first junction therebetween, said upper device adapted to be connected to said non-reference rail of said DC supply and said lower device adapted to be connected to said reference rail of said DC supply, said upper and lower devices having a respective high impedance control input and exhibiting a respective capacitance between its respective control input and its respective negative electrode;

an upper device gating means coupled to said upper device and adapted to be connected to said reference rail, said upper device gating means adapted to selectively charge said capacitance of said upper device while said lower device is conducting to bring said upper device into conduction and adapted to selectively discharge said capacitance of said upper device while said lower device is conducting to drive said upper device out of conduction;

a lower device gating means coupled to said lower device and adapted to be connected to said reference rail, said lower device gating means adapted to selectively charge said capacitance of said lower device while said upper device is conducting to bring said lower device into conduction and adapted to selectively discharge said capacitance of said lower device while said upper device is conducting to drive said lower device out of conduction;

a second converter leg connected to said other end of said impedance and adapted to be connected to said other of said rails, said second leg being comprised of a series connected pair of circuit elements forming a second junction therebetween;

said first and second junctions adapted to be connected to either end of a load, respectively; and

power supply means for supplying a DC voltage to said upper device gating means, said power supply means comprising:

resistance means adapted to be coupled to one

side of said power supply means,

voltage regulator means connected in series with said resistance means at a third junction and adapted to be coupled to the other side of said power supply means, and

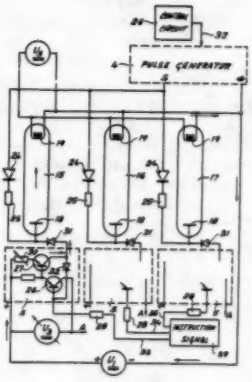
means coupling said third junction to said upper device gating means.

4,649,322

ENERGIZING ARRANGEMENT FOR CONTROLLING THE LUMINOUS INTENSITY OF AT LEAST ONE DISCHARGE LAMP AND USE OF SUCH ARRANGEMENT

Alberto Tellas; Pierre Desarzens, and Philippe Deglon, all of Bienne, Switzerland, assignors to Omega Electronics S.A., Switzerland

Filed Jan. 23, 1985, Ser. No. 693,923
Claims priority, application France, Feb. 3, 1984, 8401800
Int. Cl.[4] G05F *1/00*; H05B *37/02, 39/04, 41/00*
U.S. Cl. 315—306 **17 Claims**



1. An energizing arrangement for controlling, in response to at least one instruction signal, the luminous intensity of at least one light emitting element having at least one discharge lamp, said arrangement comprising a voltage pulse generator including at least a direct voltage source and a switch means connected in series with said direct voltage source and activated at predetermined periodic intervals to provide voltage pulses of short duration to said lamp in order to start the discharge in the lamp, an instruction-signal producing means for producing a controllable instruction signal and for allowing the modification of said instruction signal without changing activation of said switch means, and a direct current source of essentially constant amplitude responsive to said instruction signal and

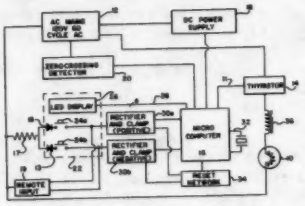
adapted to provide the lamp after each voltage pulse with a discharge maintenance current, the duration of said maintenance current after each voltage pulse being determined by said instruction signal, whereby the instruction signal can be modified to vary the duration of the maintenance current after each voltage pulse to thereby vary the luminous intensity of said light emitting element without changing said voltage pulses for starting discharge of said lamp and without otherwise changing the amplitude of said maintenance current.

4,649,323

MICROCOMPUTER-CONTROLLED LIGHT SWITCH

Gordon W. Pearlman, and Steven B. Carlson, both of Portland, Oreg., assignors to Lightoller Incorporated, Jersey City, N.J.

Filed Apr. 17, 1985, Ser. No. 724,015
Int. Cl.[4] H05B *37/02*
U.S. Cl. 315—307 **21 Claims**



1. A light level controller including a source of light connected to at least one control switch means having a depressed state and a non-depressed state comprising:

(a) preset light intensity means for causing the light to assume a desired level of intensity when said control switch means remains in a depressed state for more than a period of transitory duration; and

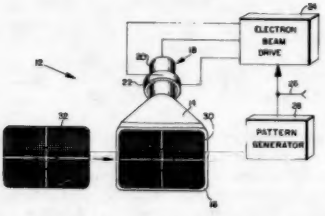
(b) automatic fading means for causing the light to fade towards said desired level of intensity when said switch is momentarily depressed.

4,649,324

METHOD AND APPARATUS FOR ADJUSTING CRT GEOMETRY

John M. Guerra, and William T. Plummer, both of Concord, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 3, 1984, Ser. No. 677,298
Int. Cl.[4] H01J *29/56*
U.S. Cl. 315—370 **8 Claims**



1. Apparatus for correcting geometric defects in images produced by a CRT system, the CRT system including a viewing screen, means for generating an electron beam directed onto the viewing screen, means for driving the electron beam so as to sweep the viewing screen both vertically and horizontally in a repetitive and fixed manner, means for selectively tuning the drive means to alter the fixed manner in which it causes the electron beam to repetitively sweep the viewing screen, and means for modulating the electron beam as it repetitively sweeps the viewing screen to generate images on the viewing screen, said apparatus comprising:

a reference pattern image adaptable for viewing by transmitted light;

means for supporting said reference pattern image in superposed relationship with respect to the viewing screen of the CRT system; and

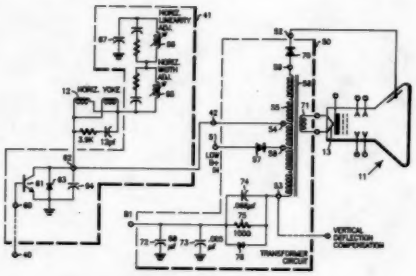
pattern generating means for controlling the CRT modulating means to cause the electron beam to form a test pattern on the viewing screen having the same general character as said reference pattern image, whereby said reference pattern image and the test pattern formed on the viewing screen, when viewed in superposed relationship by an operator, will present viewable moire patterns indicative of any geometric defects present in the test pattern as caused by maladjustments within the drive means, which maladjustments may then be corrected by manipulation of the tuning means to eliminate the initially viewable moire patterns.

4,649,325

SCANNING CRT CONTROL SYSTEM

Thomas R. Guerin, Hoffman Estates, and Theodore V. Lester, Schiller Park, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 21, 1986, Ser. No. 820,778
Int. Cl.[4] H01J *29/52*
U.S. Cl. 315—383 **10 Claims**



1. A CRT control system comprising:

CRT means, including at least a horizontal deflection yoke, an electron beam gun and a CRT screen effectively maintained at a high voltage potential, said CRT means receiving at least an amplified varying beam current intensity signal which is variable in accordance with at least horizontal beam position and a horizontal beam position sweep signal which determines horizontal beam position, said beam intensity and horizontal position signals together defining a desired horizontal line pattern on the CRT screen, at least several different horizontal lines capable of being effectively simultaneously displayed on said screen;

video driver means, coupled to said CRT means, for receiving operative power and current from a first DC power supply signal provided at a power supply terminal and for receiving a video input signal and providing, in response thereto, said amplified beam current intensity signal to said CRT means;

horizontal deflection yoke driver means coupled to said CRT means for receiving horizontal sync pulses and providing, in response thereto, said horizontal beam position sweep signal to said CRT means, said horizontal position sweep signal having a varying magnitude and having a

frequency determined by the frequency of said horizontal sync pulses;

transformer means, having at least a primary winding, for receiving a periodic pulsed input signal having a frequency corresponding to said horizontal position sweep signal, as well as receiving a DC power input signal, and developing, in response thereto, both a high voltage DC output signal at a first transformer output terminal coupled to said CRT screen and a lower voltage power supply signal at a second transformer output terminal coupled to said video driver means, said lower voltage power supply signal determining said first DC power supply signal of said video driver means;

wherein the improvement comprises,

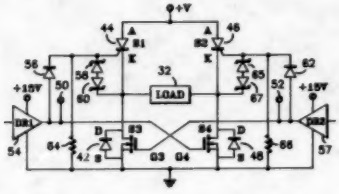
compensation circuit means connected in series between said second transformer output terminal and said video driver means power supply terminal for providing said first DC power supply signal to said video driver means in response to said lower voltage power supply signal and for developing a compensating signal at said second transformer output terminal in accordance with each horizontal video scan line, said compensating signal having a frequency corresponding to the frequency of the horizontal position sweep signal and having a magnitude varying in accordance with the average current loading of each individual horizontal scan line as indicated by the operative power current drawn by said video driver means, said compensating signal causing variation of the horizontal position of the electron beam to maintain horizontal orientation between different sequential horizontal scan lines regardless of average beam current loading of each horizontal line.

4,649,326

HIGH VOLTAGE MOS SCR AND POWER MOSFET "H" SWITCH CIRCUIT FOR A DC MOTOR

Jeffrey G. Mansmann, and Philip W. McEntarfer, both of Chandler, Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Jun. 30, 1986, Ser. No. 880,253
Int. Cl.[4] H02P 1/22
U.S. Cl. 318—293 **8 Claims**



7. In an SCR and MOSFET "H" switch circuit having:

a first SCR having first anode and cathode terminals and a gate terminal, said first anode terminal connected to a supply voltage terminal for coupling to a source of supply voltage, said first cathode terminal for coupling to a first input terminal of a DC motor and said gate terminal of said first SCR for coupling to a first control terminal;

a second SCR having second anode and cathode terminals and a gate terminal, said second anode terminal connected to said first anode terminal, said second cathode terminal for coupling to a second input terminal of said DC motor and said gate terminal of said second SCR for coupling to a second control terminal;

a first MOSFET having first drain and source terminals and a gate terminal, said first source terminal for coupling to a common voltage line, said first drain terminal connected to said second cathode terminal, and said gate terminal of said first MOSFET connected to said first control terminal; and

a second MOSFET having second source and drain terminal and a gate terminal, said second source terminal connected to said first source terminal, said second drain terminal connected to said first cathode terminal, and said gate terminal of said second MOSFET connected to said second control terminal, the improvement comprising:

first gate clamp means coupled to said first control terminal, to said cathode terminal of said first SCR, to said gate terminal of said first SCR and to said common voltage line for restricting the voltage from said cathode terminal of said first SCR to said gate terminal of said first SCR to a predetermined level; and

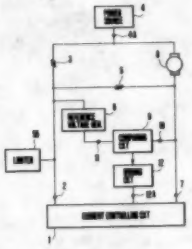
second gate clamp means coupled to said second control terminal, to said cathode terminal of said second SCR, to said gate terminal of said second SCR and to said common voltage line for restricting the voltage from said cathode terminal of said second SCR to said gate terminal of said second SCR to a predetermined level.

4,649,327

ELECTRIC MOTOR CONTROL CIRCUIT

Eiichi Ishii, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 6, 1985, Ser. No. 730,412
Claims priority, application Japan, May 10, 1984, 59-93143
Int. Cl.[4] H02P 5/16
U.S. Cl. 318—310 **4 Claims**



1. A motor control circuit comprising

a source terminal;

a first current path including a resistor;

a second current path including a motor to be controlled;

a current controlling circuit having a first output terminal connected to said source terminal through said first current path, a second output terminal connected to said source terminal through said second current path, and an input terminal, currents outputted from said first and second output terminal being controlled by an input signal supplied to said input terminal;

a reference voltage generator with its input terminal connected to said first output terminal of said current controlling circuit for maintaining voltage between input and output terminals of said reference voltage generator at a predetermined reference voltage;

a comparing circuit with one input terminal connected to the output terminal of said reference voltage generator and the other input terminal connected to said second output terminal of said current controlling circuit for comparing voltages supplied to said two input terminals to produce a result of comparison signal;

a driving circuit connected to receive said result of comparison signal for supplying a control signal to said input terminal of said current controlling circuit;

a constant voltage generator provided independently of said reference voltage generator and generating a constant voltage at its output terminal;

a limiter means coupled between the output terminal of said constant voltage generator and said first output terminal

of said current controlling circuit for preventing voltage at said first output terminal of said current controlling circuit from becoming lower than said reference voltage in response to said constant voltage generated by said constant voltage generator and the voltage at said first output terminal of said current controlling circuit, the voltage at said first output terminal of said current controlling circuit being limited, when a source voltage starts to be applied to said source terminal, to a level larger than said reference voltage and smaller than a steady voltage at said first output terminal of said current controlling circuit.

4,649,328

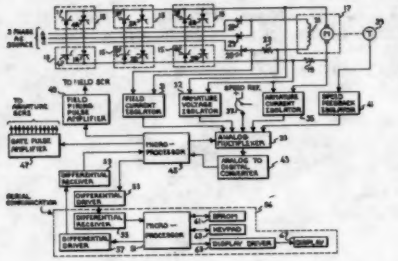
METHOD FOR AUTOMATIC SPEED LOOP TUNE-UP IN A MACHINE DRIVE

John A. Leonard, Earlysville, Va., and Harry A. Plumb, Erie, Pa., assignors to General Electric Co., Charlottesville, Va.

Filed Dec. 26, 1985, Ser. No. 749,070

Int. Cl.[4] H02P 5/16

U.S. Cl. 318—317 **5 Claims**



1. A method of tuning up a speed loop in a drive system for a motor coupled to a load, said drive system having a current control loop, the method comprising the steps of:

setting a commanded current at a minimum value sufficient to effect acceleration of the motor;

calculating motor-load inertia from the time required to accelerate the motor to a predetermined speed in response to the commanded current;

selecting a speed loop crossover frequency; and

setting speed loop parameters based on the calculated motor-load inertia to achieve the selected crossover frequency thereby tuning up the speed loop.

4,649,329

ELECTRIC ACTUATORS

David J. Wickham, Chippenham, England, assignor to Westinghouse Brake and Signal Co., Chippenham, England

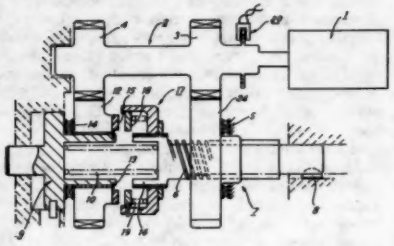
Filed Apr. 18, 1985, Ser. No. 724,590

Claims priority, application United Kingdom, May 30, 1984, 8413810

Int. Cl.[4] H02K 7/10

U.S. Cl. 318—372 **10 Claims**

1. An electric actuator comprising an electric motor for determining the output force generated on an output member by a spring means; a drive shaft driven by the electric motor and comprising first and second drive means, a first driven means driven by said first drive means, a non-rotational but axially movable intermediate member which is threadedly engaged with said first driven means; said spring means comprising spring, located between the intermediate member and the output member, for transmitting axial movement of the intermediate member to the output member so long as the output member is free to move and for, when the output member is restrained from movement, generating the output force on the output member upon continued operation of the electric motor; a second driven means driven by said second drive means; a stop means, carried by the intermediate member and adjustable in position with respect thereto in the direction in which the intermediate member is axially movable, for engaging the second driven means to arrest the rotation thereof and



to thus arrest rotation of the second drive means and, hence, by thus arresting rotation of the second drive means, to arrest further operation of the electric motor in the direction thereof which increases the output force generated on the output member.

4,649,330

CONTROLLING DEVICE OF A DRILL FOR REGULAR AND REVERSED ROTATION IN NON-CONTACT TYPE

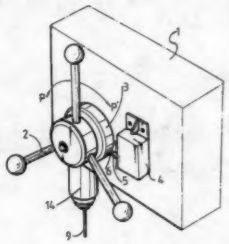
In S. Kim, 134-21, Cheongdam-dong, Kangnam-Ku, Seoul, Rep. of Korea

Filed Feb. 6, 1985, Ser. No. 698,687

Claims priority, application Rep. of Korea, Jun. 20, 1984, 84-3457

Int. Cl.[4] H02P 3/20

U.S. Cl. 318—756 **2 Claims**



1. A device for changing the rotation of a drill from a forward to a reverse direction which comprises

a drill,

an AC single-phase motor operatively connected to said drill for driving the same,

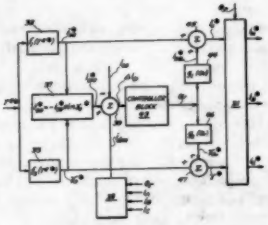
a circular measuring plate connected to said drill, said circular measuring plate having a handle, and a groove disposed on the periphery of said plate, and

a microswitch containing electrical terminals and being operatively connected to said motor, said microswitch containing a bar which is pivotally disposed to engage and disengage said microswitch, said bar having a spring biased arm which extends from said microswitch to slidably engage and rotate with the periphery of the measuring plate, whereby when the handle of the measuring plate is rotated in the left or right direction, the bar of the microswitch is caused to move in a corresponding upward or downward direction along the periphery of the measuring plate, until it engages said slot whereby the direction of rotation of the motor is reversed.

4,649,331
FLUX-WEAKENING REGIME OPERATION OF AN INTERIOR PERMANENT MAGNET SYNCHRONOUS MOTOR

Thomas M. Jahns, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 13, 1985, Ser. No. 733,160
Int. Cl.[4] H02P 5/40
U.S. Cl. 318—798 17 Claims



1. A method for constant horsepower operation of an interior permanent magnet motor synchronous drive system, said system including a current regulated PWM inverter wherein actual stator current in the motor is controlled according to a commanded stator current at a prescribed angle in relation to the quadrature axis of said rotor, said method comprising the steps of:

comparing commanded stator current with actual stator current to obtain a difference signal whose growth is indicative of said inverter being saturated;

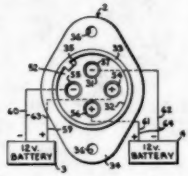
integrating said difference signal to provide an error compensation signal; and

modifying said commanded stator current such that the angle between commanded stator current and said rotor quadrature axis is increased according to said error compensation signal, so that said difference signal is reduced to substantially zero.

4,649,332
TROLLING MOTOR BATTERY CONNECTOR SYSTEM

Stuart D. Bell, R.R. 2, Camp Point, Ill. 62320

Filed Aug. 26, 1985, Ser. No. 769,406
Int. Cl.[4] H02J 7/00; H01M 10/46; H01R 13/62
U.S. Cl. 320—7 7 Claims



1. A trolling motor battery power and charging plug structure for reception in a keyed receptacle to connect with two pairs of pin sockets of the receptacle which are arranged in a selected pattern and connected respectively to the terminals of a pair of batteries, said structure comprising:

(a) a nonconductive plug pin mounting body;

(b) two pairs of elongated conductive plug pins positioned in said pin mounting body in a selected pattern, each pin having an outer end and an opposite inner end, said outer end being split to form a pair of opposing resilient outer ends;

(c) key means on said pin mounting body;

(d) a threaded plug pin bore formed in the inner ends of each of said pins to connect the conductor of a cable to said pin;

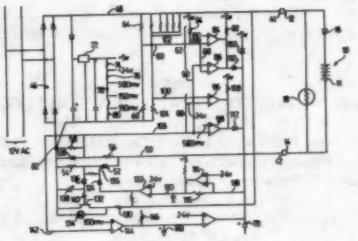
(e) a conductive jumper link extending between a selected pair of said pins and cooperating with the plug pin bores thereof to electrically interconnect said selected pair of said pins; and

(f) a nonconductive enclosure shell cooperating with said pin mounting body to enclose the cable connection bores and said jumper link and forming a handle for gripping to insert said plug structure into a receptacle.

4,649,333
TWO TERMINAL NICAD BATTERY CHARGER WITH BATTERY VOLTAGE AND TEMPERATURE SENSING

Derek V. Moore, Rexdale, Canada, assignor to Levitt-Safety Limited, Toronto, Canada

Filed Apr. 30, 1985, Ser. No. 729,156
Int. Cl.[4] H02J 7/10
U.S. Cl. 320—31 54 Claims



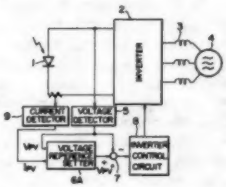
1. In a method of charging a battery of a two-terminal battery pack through the corresponding two charging terminals of said battery pack by supplying charging voltage to said two charging terminals from a charging circuit, said charging circuit having terminals connectable to said two charging terminals, respectively, to supply said charging voltage, providing said charging circuit with an electrical battery temperature measuring means in association with said two charging terminals, measuring battery temperature, and separating said two charging terminals from said charging circuit terminals after said battery is charged to a desired level, the improvement comprising:

effectively electrically removing said battery from said charging terminals while electrically measuring battery temperature through said two charging terminals by said electrical measuring means.

4,649,334
METHOD OF AND SYSTEM FOR CONTROLLING A PHOTOVOLTAIC POWER SYSTEM

Kihei Nakajima, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Oct. 17, 1985, Ser. No. 788,744
Claims priority, application Japan, Oct. 18, 1984, 59-217326; Jan. 25, 1985, 60-11900
Int. Cl.[4] G05F 5/00
U.S. Cl. 323—299 20 Claims



6. A control system for controlling a photovoltaic power

system including a solar battery and a power converter receiving the output of the solar battery and being controlled in such a manner that the voltage of the solar battery is maintained at a voltage reference which is determined in accordance with the operating condition of the photovoltaic system thereby to maximize the power of the solar battery, said control system comprising

means for judging whether each of the voltage and the power of the solar battery is increasing or decreasing,

selecting means for selecting one of a first mode in which the voltage reference is decreased and a second mode in which the voltage reference is increased,

means responsive to the judging means for switching the selecting means to select the first mode when the power is found to be decreasing and the voltage is found to be increasing, and switching the selecting means to select the second mode when the power and the voltage are both found to be decreasing, and

means for controlling the power converter in such a manner that the voltage is maintained at the voltage reference.

4,649,335

EQUIPMENT FOR LOCATING A SIGNAL REFLECTION POINT IN A TRANSMISSION LINE

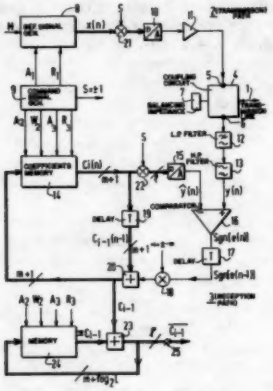
Jean Lassaux, Lannion, and Henry Clement, Kermaria Sulard, both of France, assignors to Telecommunications Radioelectriques et Telephoniques, Paris, France

Filed Dec. 5, 1984, Ser. No. 678,322

Claims priority, application France, Dec. 7, 1983, 83 19570

Int. Cl.[4] G01R *31/08*

U.S. Cl. 324—52 **6 Claims**



1. In equipment for identifying a reflection point in a transmission line by determining the impulse response characteristic of said line for an echo signal produced at said reflection point in response to a transmission signal; said equipment having transmission means for generating the transmission signal, reception means for receiving the echo signal, and a coupling circuit for coupling said transmission means and said reception means to said transmission line; said transmission means comprising means for generating a reference signal constituted by successive binary sequences each having a duration NT equal to at least twice the propagation time of each such sequence over said transmission line, N being an integer and T being the duration of a bit in each such sequence, and means for producing said transmission signal from said reference signal; the improvement characterized in that

said binary sequences of said reference signal each comprise only a single bit of non-zero value and in that said reception means comprises:

memory means for storing N coefficients Ci, i being an integer going from 0 to N−1;

means for cyclically reading-out said coefficients Ci from said memory means at instants nT, where nT=(KN+j)T, and modifying the read-out coefficients Ci by successive iterations to thereby derive modified coefficients, n being an integer going from $-\infty$ to $+\infty$, K being an integer going from $-\infty$ to $+\infty$ and which characterizes each read-out cycle, and j being an integer going from 0 to N−1 and which characterizes the instant of read-out in a read-out cycle;

digital-to-analog converting means connected to said memory means for converting said read-out coefficients Ci to an analog signal;

comparison means connected to said converting means and to said coupling circuit for deriving at each read-out instant nT the difference e(n) between said received echo signal and the analog signal produced by said converting means, thereby also deriving the sign of e(n), Sgn e(n);

and means coupled to said comparison means and to said cyclic read-out means for modifying each of said coefficients Ci once during each read-out cycle at instants at which j=i, such modification comprising addition to each coefficient Ci of a term equal to α.e(n) or α.Sgn (e(n)), α being a coefficient less than 1;

and means for storing said modified coefficients in said memory means;

whereby the modified coefficients stored in said memory means constitute, after a sufficient number of said modifications, the values at the instants nT of the impulse response characteristic of said line for said echo signal which values are processed to identify the reflection point.

4,649,336

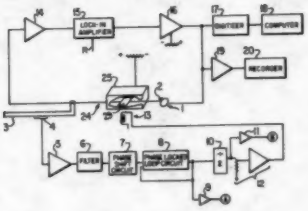
AUTOMATIC, SELF SUSTAINING PROBE FOR MEASURING THE WORK FUNCTION

Patrick E. Bindner; Eric B. Selkirk, and Peter R. Norton, all of Deep River, Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Jan. 29, 1985, Ser. No. 695,834

Int. Cl.[4] G01R *31/02*

U.S. Cl. 324—61 R **14 Claims**



12. A method of measuring the work function of a surface of a sample comprising the steps of:

(i) placing a reference electrode in close proximity to the surface under examination;

(ii) vibrating with a drive signal the reference electrode at a preselected resonant frequency to generate an ac voltage signal between the reference electrode and the surface;

(iii) detecting the resonant frequency of the reference electrode which varies without surrouding conditions to generate a feedback signal;

(iv) using the feedback signal to adjust the frequency of the drive signal to match the resonant frequency of the reference electrode; and

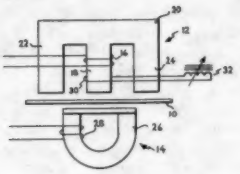
(v) measuring the work function by sensing the ac voltage signal between the reference electrode and the surface under examination.

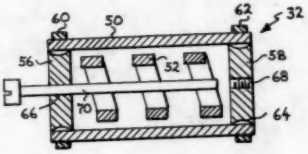
4,649,337

PHASE LAG ADJUSTMENT IN ELECTRIC METER

Harold L. Stucker, Somersworth, N.H., assignor to General Electric Company, Somersworth, N.H.

Filed Mar. 14, 1985, Ser. No. 711,718
Int. Cl.[4] G01R 11/02; H01F 21/06
U.S. Cl. 324—138 10 Claims





1. A phase lag adjust for an electric meter, said electric meter being of a type having a voltage stator and a current stator aligned with each other on opposed sides of a rotatable disk, said voltage stator being of a type having an E-shaped core with a voltage stator coil disposed on a center leg thereof, comprising:

a phase lag adjustment loop at least partly encircling said center leg in a location effective to contain at least a substantial portion of a flux in said center leg;

a variable inductor;

said variable inductor including a coil in series with said phase lag adjustment loop;

a cylindrical shell of a magnetic material enclosing said coil;

first and second threaded bushings disposed in first and second ends of said cylindrical shell;

axes of said first and second threaded bushings being substantially aligned with each other and with an axis of said coil;

means for clamping said cylindrical shell to said first and second threaded bushings; and

a ferromagnetic threaded member threadably engageable selectably in either one of said first and second threaded bushings and adjustable along said axis of said coil whereby an inductance of said variable inductor is varied.

4,649,338

FINE LINE CIRCUITRY PROBES AND METHOD OF MANUFACTURE

William P. Dugan, Pomona, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

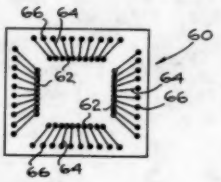
Continuation of Ser. No. 125,814, Feb. 28, 1980, abandoned.
This application Jun. 21, 1982, Ser. No. 390,815
Int. Cl.[4] G01R 1/06, 31/02
U.S. Cl. 324—158 P 10 Claims

1. A probe device for testing microcircuits comprising:

a base circuit board;

a plurality of individual conductive metal, hollow cylindrical, thick-walled probe contact elements mounted in an array adjacent a central portion of said circuit board, said elements protruding a predetermined distance beyond one face of said board and passing through corresponding individual holes in said board to a corresponding array of individual circuit paths on the opposite face of the board terminating in a like plurality of terminals mounted peripherally about the array of probe contact elements adjacent the peripheral edges of said board, both the probe contact elements and the circuit paths being integrally formed on said board;

each individual probe contact element being affixed in the



circuit board by plating the metal of the probe element within its corresponding hole; and

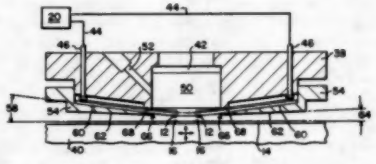
a coating of solder melted onto the probe contact elements and extending circumferentially about the protruding portion of each probe contact element to lock the probe contact element in the board.

4,649,339

INTEGRATED CIRCUIT INTERFACE

Robert H. Grangroth, Osseo, and Jerald M. Loy, Anoka, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 25, 1984, Ser. No. 603,860
Int. Cl.[4] G01R 31/02, 1/06
U.S. Cl. 324—158 F 12 Claims



1. An interface structure for testing a selected integrated circuit device through a plurality of contacts on an exposed surface of the device, the interface structure comprising:

a flexible sheet having first and second opposing surfaces;

a plurality of electrical contacts protruding beyond the first surface of the sheet in a pattern designed to mate with a plurality of contacts on a selected integrated circuit device;

a plurality of thin film conductors disposed on and adhering to the sheet in a pattern, the conductors each being connected to at least one of the contacts on the sheet and being adapted for electrical connection to permit making such a connection to a circuit for testing the device;

means for preforming into a generally domed shape at least a portion of the sheet which includes thereon at least one of the contacts with the first surface of the flexible sheet including the convex surface of the domed shape; and

means for flexing the flexible sheet so that the contacts on both the sheet and the device may be brought into initmate contact.

4,649,340

MAGNETIC DIFFERENTIAL POSITION SENSOR

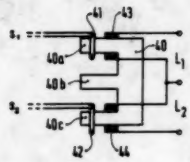
Erich Zabler, Stutensee, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 22, 1983, Ser. No. 468,411

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1982, 3208785

Int. Cl.[4] G01B *7/14*; H01F *21/02*; G08C *19/06*

U.S. Cl. 324—207 **18 Claims**



1. Relative or differential position sensor, to determine the relative position of two independently linearly movable objects (15, 22) with respect to a reference, having

an H-shaped magnetic core (32) including a yoke and a plurality of salient legs or poles, at least two of said legs (32*c*, 32*d*) being located in alignment with each other and each having a winding thereon which, when energized, produces a magnetic field and forms, in combinations with the yoke, a magnetic circuit including magnetic field lines;

a first one of said windings (35), located on a first one of the salient legs (32*c*);

a second one of said windings (36), located on a second one of the salient legs (32*d*), said first and second windings being located, respectively, on two aligned salient poles, being serially connected to form an inductance (L) and the magnetic field lines of said first and second coils superposing or combining in a common region of said core;

two magnetic circuit control means (33, 34) coupled to the legs on which said windings are wound, and respectively coupled to said two objects, the relative position of which is to be determined; and

inductance sensing means (38, 39), including an oscillator, coupled across outer terminals of said windings and evaluating the difference, if any, between the inductances of the magnetic circuits produced by the respective salient legs and said windings.

4,649,341

INDUCTIVE MEASURING ARRANGEMENT FOR DETERMINING THE POSITION OF A MOVABLE CORE MEMBER

Gerald Ulbrich, Hanover, and Detlev Neuhaus, Langenhagen, both of Fed. Rep. of Germany, assignors to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Apr. 23, 1984, Ser. No. 602,840

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1983, 3314440; Dec. 5, 1983, 3343885

Int. Cl.[4] G01B *7/14*; G01R *27/26*

U.S. Cl. 324—207 **4 Claims**

1. An inductance measuring arrangement comprising:

(a) an inductive coil;

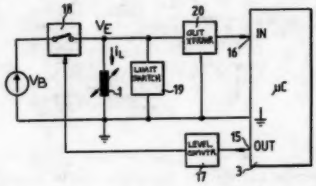
(b) a movable core member variably positionable within said inductive coil such that, the electrical characteristics of said inductive coil vary according to such position of said movable core member;

(c) a voltage source coupled at times, to said inductive coil such that a voltage of predetermined amplitude is imposed on said inductive coil, and thereby develops a charging current thereacross as a function of such electrical characteristics when such position of said movable core member is to be determined, such charging current being selectable in value to at least one of a predetermined charging current level and a predetermined charging current time duration;

(d) evaluating means coupled to said inductive coil for evaluating such charging current developed therethrough and deriving such position of said movable core member therefrom;

(e) current-limiting means coupled between said voltage source and said inductive coil for limiting such charging current to a predetermined peak value, said evaluating means evaluating the time duration to reach such predetermined peak value and thereby deriving the position of said movable core member therefrom; and

(f) said current-limiting means having a control voltage portion and a current source portion, said current source portion having a first transistor being biased upon initiation of an enabling signal from said evaluating means such that such charging current can flow thereover to said inductive coil, said first transistor being disabled upon



removal of such enabling signal to thereby block the flow of such charging current to said inductive coil such that said inductive coil then discharges, said control voltage portion having a second transistor with a second base lead connected to a first base lead of said first transistor such that such enabling signal is received at said base leads by said first and second transistors simultaneously, said second transistor further having a collector lead connected to said second base lead thereby establishing a blocking condition of said second transistor which prevents said second transistor from turning on until such charging current exceeds a first predetermined value lesser in magnitude than said predetermined peak value, said second transistor being turned on establishing a control voltage value across a control resistor connected between said voltage source and an emitter lead of said second transistor, such control voltage value being applied to a first resistor associated with said current limiting portion to establish such predetermined peak value for such charging circuit.

4,649,342

APPARATUS USING INCLINED SENSOR FOR DETECTING RELATIVE DISPLACEMENT

Shigekazu Nakamura, 1-32-402, Nishiageo-Daiichi-Danchi, 845-1, Ohaza-Koshikiya, Ageo City, Saitama Pref., Japan

Filed Jun. 11, 1984, Ser. No. 619,135

Claims priority, application Japan, Jun. 17, 1983, 58-107828

Int. Cl.[4] G01B *7/14*

U.S. Cl. 324—208 **8 Claims**

1. An apparatus for detecting a relative displacement of a magnetic record medium on which a magnetization pattern is recorded along a displacing direction, said pattern being in the form of a plurality of successive magnetized areas, each area extending in a first direction, said apparatus comprising

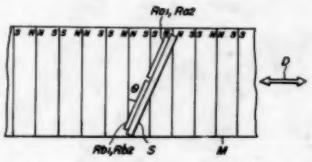
a common substrate having a flat surface which is arranged such that it is inclined by an angle with respect to said first direction of said areas of said magnetization pattern;

at least two magnetic detectors arranged on said flat surface at positions which are shifted in said first direction, each of

said magnetic detectors comprising at least two magnetoresistive elements and at least one insulating layer arranged between the magnetoresistive elements;

means for magnetically biasing said at least two magnetoresistive elements of each magnetic detector in opposite directions;

means for connecting said at least two magnetoresistive elements of each of said detectors into at least one bridge circuit having first and second input terminals and first and second output terminals, said first and second input



terminals being connectable to an electric power source; and

at least one differential amplifier having first and second input terminals connected to said first and second output terminals of said at least one bridge circuit;

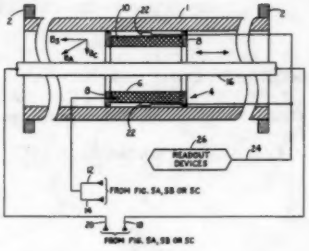
the angle by which said flat surface is inclined with respect to said first direction being set such that output signals appearing at said first and second output terminals of the bridge circuit have a phase difference of about 180° with respect to a pitch of the magnetization pattern.

4,649,343

ELECTROMAGNETIC FLUX LEAKAGE INSPECTION SYSTEM FOR FERROMAGNETIC TUBES

Robert J. Birchak, Spring, Tex.; Flora J. Harris, and Amos E. Holt, both of Lynchburg, Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Dec. 27, 1983, Ser. No. 566,020
Int. Cl.⁴ G01N *27/83;* G01R *33/12*
U.S. Cl. 324—220 **5 Claims**



5. Apparatus for inspecting, in-situ, a heat exchanger tube, comprising:

(a) means for inducing into the wall of a tube a resultant magnetic field produced by the vectorial addition of a first and a second magnetic field, said means including:

(i) a scanner for transversing the tube having a hollow cylindrical body, said hollow cylindrical body being provided with an outwardly protruding rim at either end extending toward said tube to guide said scanner when scanning the tube from the bore of the tube;

(ii) a first solenoid coil, carried by said body in close proximity to the wall of the tube, suitable for being energized by a first electrical source to generate said first magnetic field;

(iii) a cylindrical conductor centered within said tube, suitable for being energized by a second electrical source to generate said second magnetic field; and

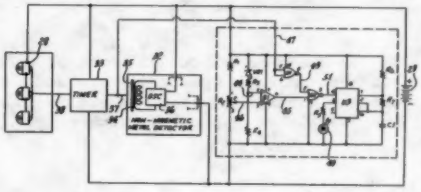
(b) an array of sensors mounted on said first solenoid coil around the outer circumference thereof to be spaced away from the wall of said tube, generating output signals responsive to the leakage flux produced by a flaw in the wall of the tube.

4,649,344

TEST CIRCUIT FOR DETECTOR USED IN WELL BORE

Helmut Moll, Irvine, and Roger E. Ritchie, Santa Ana, both of Calif., assignors to Scientific Drilling International, Houston, Tex.

Filed May 2, 1984, Ser. No. 606,210
Int. Cl.⁴ G01R *35/00;* G01N *27/72*
U.S. Cl. 324—221 **13 Claims**



1. A device comprising:

a body to be lowered into a well pipe, the pipe formed primarily of magnetic material and having a section at a predetermined sub-surface location of electrically conductive essentially non-magnetic material;

an instrument carried by said body for reception in said essentially non-magnetic pipe section and when energized to produce a record dependent on the magnetic field at said location;

a detector carried by said body for automatically controlling said instrument and operable upon arrival at said location to sense the presence of said non-magnetic section of pipe and in response thereto produce a signal causing energization of said instrument to produce said record;

said detector being operable also to produce said signal when said body is at the surface of the earth if a test element of electrically conductive non-magnetic material is brought near the body; and

a test circuit responsive to development of said signal at the surface of the earth to produce an indication that the detector is in working condition without operation of said instrument.

4,649,345

NMR IMAGING METHOD

Kiyoshi Yoda; Hidenobu Itagaki; Satoshi Fujimura, and Tadatoshi Yamada, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 16, 1985, Ser. No. 766,316
Claims priority, application Japan, Aug. 17, 1984, 59-172027; Apr. 10, 1985, 60-77684
Int. Cl.⁴ G01R *33/20*
U.S. Cl. 324—309 **17 Claims**

1. An NMR imaging method comprising:

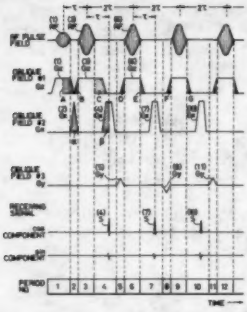
a first step of exciting nuclear spin in a given volume of a sample disposed in a magnetostatic field;

a second step of applying a first, a second and a third magnetic field gradient to said volume;

a third step of rephasing the nuclear spin under said second magnetic field gradient by applying a 180° pulse;

a fourth step of phase-modulating said nuclear spin in a direction of said third magnetic field gradient prior to or

after reading out of a spin echo signal derived from said rephasing of said spin; and



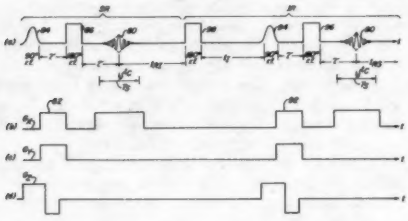
a fifth step of repeating said second to fourth steps, wherein said third magnetic field gradient in each of said fourth steps has a constant absolute value and a direction of said third magnetic field gradient is alternating.

4,649,346

COMPLEX QUOTIENT NUCLEAR MAGNETIC RESONANCE IMAGING

Hong-Ning Yeung, Richmond Heights; Chiming Kao, Mayfield Heights, and Arnold H. Lent, Macedonia, all of Ohio, assignors to Technicare Corporation, Cleveland, Ohio

Filed Nov. 9, 1983, Ser. No. 550,523
Int. Cl.[4] G01R *33/24*
U.S. Cl. 324—309 **12 Claims**



1. In a nuclear magnetic resonance imaging system, including a magnet for producing a magnetic field in which an imaging subject is to be located, a radio frequency coil and a gradient field coil, apparatus comprising:

means for collecting a first sequence of NMR signals, including means for applying a first excitation pulse sequence, means for applying a given gradient field, and means for detecting and storing said first sequence of NMR signals;

means for collecting a second sequence of NMR signals, including means for applying a second excitation pulse sequence, means for applying said given gradient field, and means for detecting and storing said second sequence of NMR signals;

means for performing a two-dimensional Fourier transform of said first and second sequences, respectively, to form first and second images having data values at spatially defined image locations; and

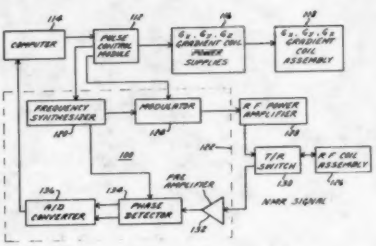
means for forming a ratio of data values of said first and second images at each spatially defined image location.

4,649,347

METHOD FOR OFF-CENTER FIELD-OF-VIEW IMAGING USING MR

Tzong Y. Hwang, Naperville, Ill., and Nicholas F. Campagna, Milwaukee, Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 15, 1985, Ser. No. 798,546
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **2 Claims**



1. A method for imaging, using MR, a predetermined region of an object, which region is removed from the isocenter of an MR system having gradient coils for generating magnetic field gradients along the x, y and z axes of a Cartesian coordinate system, said MR system having RF means for exciting and receiving MR signals from said region, said method comprising the steps of:

(a) exciting nuclear spins in said region;

(b) applying a phase-encoding gradient having one of a plurality of predetermined amplitudes to phase encode spatial information into said excited nuclear spins, said phase-encoding gradient being applied along a y' axis rotated by an angle θ relative to the y axis;

(c) receiving an MR signal from said excited spins in the presence of a readout magnetic field gradient applied along an X' axis which is orthogonal to said y' axis, said angle θ being greater than zero and selected such that said x' axis intersects said predetermined region; and

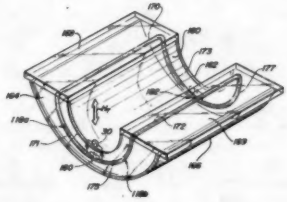
(d) repeating said steps (a)–(c) so as to sequence through each of said plurality of predetermined amplitudes.

4,649,348

RADIO FREQUENCY COILS FOR NUCLEAR MAGNETIC RESONANCE IMAGING SYSTEMS

David C. Flugan, Hudson, Ohio, assignor to Technicare Corporation, Cleveland, Ohio

Filed Aug. 20, 1984, Ser. No. 642,613
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—318 **17 Claims**



1. Nuclear magnetic resonance imaging apparatus comprising:

a magnet for producing a static magnetic field;

means for producing a field gradient with respect to said static magnetic field;

a radio frequency transmitting coil for developing magnetic resonance signals in a region within said static magnetic field;

a radio frequency receiving coil for receiving magnetic resonance signals developed in said region; and

means, coupled to said radio frequency transmitting coil and responsive to the induction of current in said transmitting coil during the reception of magnetic resonance signals by said receiving coil, for selectively connecting an impedance to said transmitting coil for rendering said radio frequency transmitting coil substantially unresponsive to reception of said magnetic resonance signals.

4,649,349

DEVICE FOR AUTOMATICALLY COMPENSATING THE MAGNETISM OF DRILL STRING MEMBERS

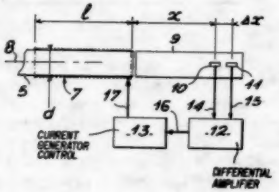
Guy Chiron, Gieres, and Jean-Charles Vidal, Meylan, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 1, 1984, Ser. No. 585,183

Claims priority, application France, Mar. 11, 1983, 83 04036

Int. Cl.[4] G01V *3/26*; G01R *33/025*; E21B *47/022*

U.S. Cl. 324—346 **3 Claims**



1. Apparatus comprising a positioning sensor for use with an earth drilling tool attached to a front end of a drill string that comprises a plurality of elongated drill string members connected end-to-end, said positioning sensor being carried by said drill string near the front end thereof and being responsive to the earth's magnetic field to produce outputs useful for controlling the direction of advance of the drilling tool, said apparatus being characterized by:

A. a sleeve of nonmagnetic material connected in the drill string adjacent to one end of one of said drill string members and near the drilling tool;

B. said positioning sensor comprising a pair of probes fixed coaxially in said sleeve and spaced apart in the direction lengthwise of the drill string by a distance substantially smaller than the distance between the probes and said one end of said one drill string member, each said probe being adapted to produce an electrical output which is dependent upon the magnetic field in its immediate vicinity;

C. a coil around said one drill string member, adjacent to said one end thereof, through which a current can be passed to produce a compensating magnetic field that opposes and nullifies the magnetic field due to existing magnetization of the drill string members and the drilling tool;

D. a differential amplifier connected with both of said probes for producing a control output dependent upon the difference between said electrical outputs of the two probes; and

E. control means connected with said differential amplifier and with said coil and arranged to energize said coil with a current which is so varied as to maintain a substantially zero differece between the electrical outputs of the two probes so that the electrical output of each probe is dependent substantially only upon the earth's magnetic field in its vicinity.

4,649,350

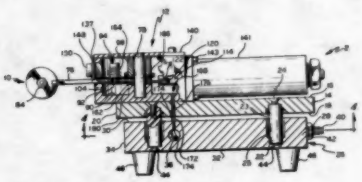
CONTAINER PIERCING DEVICE

Elton E. Rush, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 544,184, Oct. 21, 1983, Pat. No. 4,550,621, which is a division of Ser. No. 210,504, Nov. 26, 1980, Pat. No. 4,580,700. This application May 17, 1985, Ser. No. 735,034

Int. Cl.[4] G01N *27/60*

U.S. Cl. 324—452 **7 Claims**



1. Apparatus comprising:

(a) a support;

(b) at least one electrical insulator protruding from said support thereby providing an electrically isolating spacing apart between said support and a surface said spacing apart susceptible to formation of electrically conductive deposits; and

(c) means for conveying a stream of clean gas across said at least one electrical insulator and through said spacing apart between said support and said surface at a velocity sufficient to prevent formation of electrically conductive deposits thereby maintaining electrical isolation of said support.

4,649,351

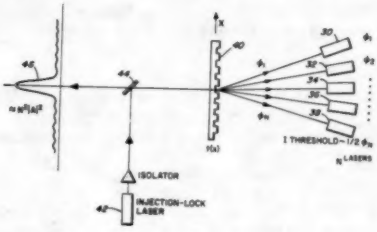
APPARATUS AND METHOD FOR COHERENTLY ADDING LASER BEAMS

Wilfrid B. Veldkamp; James R. Leger, and Gary J. Swanson, all of Lexington, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 19, 1984, Ser. No. 662,609

Int. Cl.[4] H01S *3/08*; H04B *9/00*

U.S. Cl. 330—4.3 **12 Claims**



1. Apparatus for coherently combining electromagnetic radiation from a plurality of lasers comprising:

a diffraction grating;

means for supporting said plurality of lasers to illuminate said grating; and

means for locking together the phase of said plurality of lasers;

said diffraction grating having a configuration to generate substantially equal intensities of diffraction orders corre-

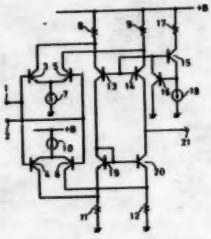
sponding to the number of said plurality of lasers while suppressing higher orders.

4,649,352

DIFFERENTIAL AMPLIFIER CIRCUIT

Robert A. Blauschild, Los Altos, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 730,908, May 6, 1985, abandoned, which is a division of Ser. No. 525,181, Aug. 23, 1983, Pat. No. 4,532,479. This application Jun. 16, 1986, Ser. No. 876,641
Claims priority, application Japan, Sep. 9, 1982, 57-157246
The portion of the term of this patent subsequent to Jul. 30, 2002, has been disclaimed.
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—261 **14 Claims**



1. A differential amplifier circuit comprising:

a differential input portion for amplifying a differential input signal to produce an amplified differential signal taken between a pair of terminals thereof; and

first, second, third, and fourth main amplifiers, each having a first flow electrode, a second flow electrode, and a control electrode for controlling current transmission between the flow electrodes, the first and second amplifiers being of like polarity with their control electrodes connected together for receiving a substantially constant bias voltage, the third and fourth amplifiers being of like polarity with their control electrodes connected together for receiving a control voltage dependent on the voltage at the second electrode of the first amplifier, the third and fourth amplifiers being complementary to the first and second amplifiers, the first electrodes of the third and fourth amplifiers respectively coupled to the terminals, the second electrodes of the first and third amplifiers coupled together, and the second electrodes of the second and fourth amplifiers coupled together for supplying an output signal representative of the input signal.

4,649,353

FREQUENCY SYNTHESIZER MODULATION RESPONSE LINEARIZATION

John R. Sonnenberg, San Diego, Calif., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 29, 1985, Ser. No. 717,353
Int. Cl.[4] H03L *7/18*
U.S. Cl. 331—8 **6 Claims**

1. A method of substantially flattening modulation response in a frequency synthesizer having a reference frequency and a variable frequency generator having a gain response that varies in response to an input parameter, comprising the steps of:

providing a charge pump having:

an output;

a current source for providing a charging current at said output, said current source having a controllable gain that is responsive to said output; and

a current sink for providing a discharging current at said output, said current sink having a controllable gain that is responsive to said output;

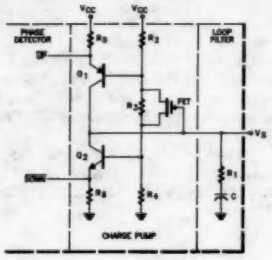
providing a loop filter;

providing a control signal to said variable frequency generator to cause generation of a synthesized frequency;

scaling said synthesized frequency with a scalar to produce a scaled synthesized frequency;

detecting any phase difference between said scaled synthesized frequency and said reference frequency, and providing a phase detection signal related to said difference;

providing said phase detection signal to said charge pump current source when a phase difference in a first direction is sensed to cause provision of said charging current at said output;



providing said phase detection signal to said charge pump current sink when a phase difference in a second direction is sensed, said second direction being opposite to said first direction, to cause provision of said discharging current at said output;

providing said output of said charge pump to said loop filter to thereby develop said control signal having a gain response substantially the reciprocal of said gain response of said variable frequency generator;

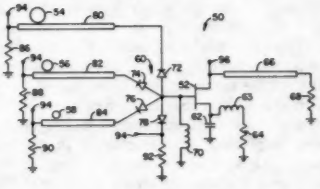
whereby the interaction of said variable frequency generator and said charge pump approximates a flat modulation response.

4,649,354

SWITCHABLE MULTI-FREQUENCY DIELECTRIC RESONATOR OSCILLATOR

Amarpal S. Khanna, Sunnyvale, Calif., assignor to Avantek, Inc., Santa Clara, Calif.

Filed Dec. 16, 1985, Ser. No. 809,161
Int. Cl.[4] H03B *5/18*
U.S. Cl. 331—99 **20 Claims**



1. A switchable dielectric resonator oscillator for generating microwave energy at a selected one of several available frequencies in the microwave range, said oscillator comprising:

a transistor operable for oscillation at a frequency in the microwave range as determined by a dielectric resonator and associated microstrip line connected as a series feedback element to the control terminal of said transistor;

switching means for selectively connecting any one of a plurality of dielectric resonators and associated microstrip lines to the control terminal of said transistor, wherein said switching means includes a plurality of diodes each con-

nected in series between a corresponding dielectric resonator and associated microstrip line and the control terminal of said transistor, and includes diode biasing means for individually biasing said diodes; and

a plurality of dielectric resonators and associated microstrip lines coupled to said switching means for selective connection to the control terminal of said transistor, wherein the oscillation frequency of said transistor is substantially equal to the resonant frequency of whichever of said dielectric resonators is connected to the control terminal of said transistor through said switching means, and wherein the resonant frequencies of said dielectric resonators are in the microwave range.

4,649,355
ROTARY MICROWAVE SWITCH

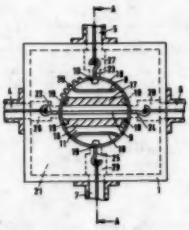
Wolfgang Ullman, Backnang, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed May 22, 1985, Ser. No. 736,697

Claims priority, application Fed. Rep. of Germany, May 25, 1984, 3419534

Int. Cl.[4] H01P 1/10

U.S. Cl. 333—106 **6 Claims**



1. A rotary microwave switch comprising: a housing having a plurality of side walls, a housing interior cavity, and a plurality of waveguide ports distributed around said side walls; a rotor having at least one rotor cavity and mounted within said housing interior cavity; and means associated with said rotor and defining at least one waveguide section; said rotor being mounted for rotation, relative to said housing, into at least one operative position for causing said waveguide section to establish a signal conducting connection between two of said ports; wherein said means defining at least one waveguide section comprise an electrically conductive plate fastened to said rotor and having at least one gap constituting said at least one waveguide section, said gap being in communication with said housing interior cavity and said rotor cavity.

4,649,356
COMPACTLY CONSTRUCTED ELECTROMAGNETIC DELAY LINE

Kazuo Kameya, Tsurugashima, Japan, assignor to Elmec Corporation, Saitama, Japan

Filed Jan. 2, 1986, Ser. No. 815,624

Claims priority, application Japan, Jan. 10, 1985, 60-1573[U]; Jan. 11, 1985, 60-2534[U]

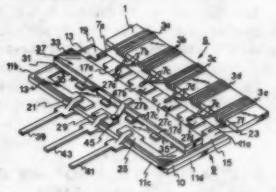
Int. Cl.[4] H03H 7/32

U.S. Cl. 333—138 **9 Claims**

1. An electromagnetic delay line comprising:

a. a coil assembly comprising a bobbin and a plurality of turns of an electroconductive element wound on said bobbin, with an input end and an output end of said electroconductive element and also a plurality of intermediate taps defined therealong, said ends and said taps being projected all in substantially the same substantially transverse direction from the axis of said bobbin;

b. an intermediate plate assembly comprising an insulating plate and on one side of said insulating plate: a first intermediate electrode, a first end of which is connected to said input end of said insulating electroconductive element adjacent a first edge of said insulating plate; a second intermediate electrode, a first end of which is connected to said output end of said electroconductive element adjacent said first edge of said insulating plate, the other ends of said first and second intermediate electrodes extending towards and terminating substantially at a second edge of said insulating plate which is opposite said first edge; a plurality of third intermediate electrodes arranged in a mutually spaced apart manner between said first and said



second intermediate electrodes with their one ends connected to said intermediate taps of said electroconductive element adjacent said first edge of said insulating plate; and a ground intermediate electrode at said second edge of said insulating plate between the ends of said first and said second intermediate electrodes thereat;

c. a capacitor electrically connected to said intermediate electrodes; and

d. a means for electrically connecting said first and second intermediate electrodes and said ground intermediate electrode from said second edge of said insulating plate to an external electrical circuit.

4,649,357
SURFACE-ACOUSTIC-WAVE FILTER

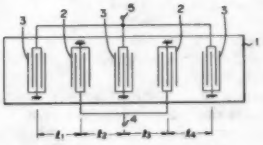
Kiyoshi Nagai, and Nobuyoshi Sakamoto, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1986, Ser. No. 832,754

Claims priority, application Japan, Feb. 25, 1985, 60-35993

Int. Cl.[4] H03H 9/64, 9/145

U.S. Cl. 333—196 **4 Claims**



1. A surface-acoustic-wave filter comprising a substrate through which a surface-acoustic-wave propagates, and input transducers and output transducers each composed of a plurality of surface-acoustic-wave interdigital transducers, for converting an electrical signal into a surface acoustic wave and vice versa, formed on said substrate, said input transducers and said output transducers being alternately disposed in the propagation direction of the surface-acoustic-wave;

wherein said surface-acoustic-wave interdigital transducers are disposed such that, when an intercentral distance between the centers of two mutually adjoining surface-acoustic-wave interdigital transducers is a reference distance l_1 and when the other intercentral distances between the centers of the mutually adjoining respective surface-acoustic-wave interdigital transducers besides said refer-

ence distance l_1, are l_2 through l_n respectively, the following equations are satisfied:

$$l_1 = m_1 \cdot \lambda$$
$$l_2 = l_1 + m_n \cdot \lambda$$
$$\vdots$$
$$l_n = l_1 + m_n \cdot \lambda$$

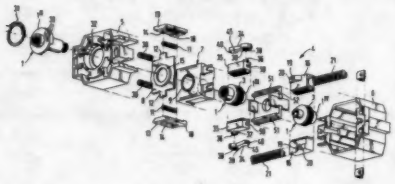
wherein λ is a wavelength of the surface-acoustic-wave and is defined by $\lambda = V/fo$ when the propagation velocity of the surface-acoustic-wave is V and a center frequency of the surface-acoustic-wave filter is fo, and m_1 is an arbitrary positive real number, and m_2 through m_n are respectively arbitrary integers, and said surface-acoustic-wave interdigital transducers are arranged such that at least one distance selected from among said respective distances l_1 through l_n differs from the other remaining distances.

4,649,358

RESET MECHANISM FOR A ROTARY SWITCH

Hubert L. Naimer, Nuvola Bianca, CH-6612 Ascona, Switzerland

Filed Dec. 9, 1985, Ser. No. 806,697
Claims priority, application Austria, Dec. 17, 1984, 3999/84
Int. Cl.[4] H01H 9/00, 67/02
U.S. Cl. 335—116 **8 Claims**



1. A reset mechanism for a rotary switch, which is manually switchable from a rest position into any desired switch position, for resetting the switch to the rest position in response to a drop of electric power supply grid voltage below a predetermined minimum voltage, which comprises

(a) an electromagnet including
  (1) a coil connectable to the electric power supply grid for energization thereof and
  (2) an armature attractable by the electromagnet coil energized by the grid voltage,

(b) a switching drive shaft having a longitudinal axis, the drive shaft including
  (1) a hand grip section for manually turning the drive shaft into any desired switch position and
  (2) a further shaft section having a pinion,
  (3) said hand grip section and said further shaft section being freely rotatable relative to each other,

(c) a reset device displaceable transversely to the shaft axis, the reset device including
  (1) rack means arranged to mesh with said further shaft section pinion and
  (2) detent means,

(d) return spring means biasing the displaceable reset device,

(e) a blocking ram device resiliently supported on the armature for displacement in the direction of the shaft axis, the blocking ram device including
  (1) detent means for blocking the reset device in any of the desired switch positions of the switch when the armature is attracted, and the blocking ram device releasing the reset device when a voltage drops below a predetermined minimum voltage,

(f) an entrainment device actuatable a section of the hand grip section, and

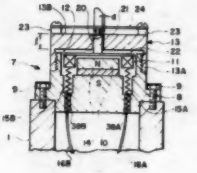
(g) transmission means arranged on the entrainment device between the reset device and the blocking ram device, the transmission means being movable essentially in the direction of the shaft axis and including
  (1) detent means engageable with the detent means of the reset device and the blocking ram device, engagement of the detent means of the blocking ram device and the transmission means and of the transmission means and the reset device being maintained only by a force effective in the direction of attraction of the armature for transmitting forces of a sufficient strength to move the switch out of its rest position.

4,649,359

EXPLOSION-PROOF ELECTRO-DISPLACEMENT CONVERTER DEVICE

Yoshikuni Doki, Yokohama; Masatoshi Fujiwara, Yokosuka; Tatsuhide Shiga, Zushi; Yohsuke Shono, Hon-Machi-Nishi; Mikio Tanaka, Nasemachi, and Yoshihiro Tsuruoka, Fujisawa, all of Japan, assignors to Yamatake-Honeywell Co. Ltd., Tokyo, Japan

Filed Jul. 10, 1985, Ser. No. 734,320
Int. Cl.[4] H01F 7/08
U.S. Cl. 335—222 **12 Claims**



1. An explosion-proof type electro-displacement converter device comprising;

a bowl-shaped first yoke,

a permanent magnet located at the center of said first yoke,

a cylindrical second yoke attached to said first yoke through said permanent magnet,

an exciter coil winding arranged in a magnetic path between said yokes,

spring means elastically supporting said winding,

sealing means for sealing an end of said first yoke,

an opening through said sealing means and

an output stem linked with said exciter coil winding and projecting through said opening which penetrates through said said sealing means while leaving an explosion-proof gap therebetween.

4,649,360

SOLENOID VALVE WITH CONTRACTIBLE ASSEMBLY RING

Roger G. Riefler, Shaker Heights, and John E. Ellison, Mayfield Heights, both of Ohio, assignors to Parker Vannifin Corporation, Cleveland, Ohio

Filed Feb. 28, 1986, Ser. No. 834,715
Int. Cl.[4] H01F 7/08
U.S. Cl. 335—255 **17 Claims**

1. A solenoid valve assembly, comprising

a valve body,

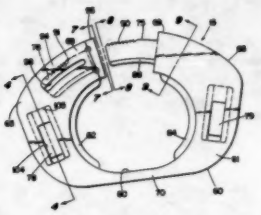
a core tube secured on said valve body and extending outwardly therefrom to a free end, said core tube having a shoulder at said free end,

a pole piece and plunger disposed in said core tube, said pole piece being fixed therein and said plunger being slidable in response to a magnetic field for actuating a valve in said valve body,

an electromagnetic coil assembly mounted on said core tube

for establishing said magnetic field in response to an electrical current, and

a contractible ring encircling said core tube at said free end between said shoulder and said coil assembly for retaining



said coil assembly on said core tube and for biasing said coil assembly toward said valve body, said ring having means thereon for adjustably securing said ring in various contracted sizes, and bias means for urging said coil assembly toward said valve body.

4,649,361

ELECTRICAL COIL FORM WITH CONNECTOR SLEEVES

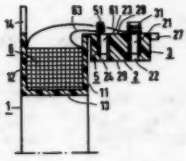
Günther Horn; Wolfgang Pieper, both of Wuerzburg, and Heribert Roeser, Mainbernheim, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 27, 1985, Ser. No. 781,071

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1984, 3435888

Int. Cl.[4] H01F *15/10, 27/30*

U.S. Cl. 336—192 **24 Claims**



1. A coil form for use with a coil having a U-shaped winding compartment opened radially outward limited axially by end flanges; a plastic bracket formed onto one end flange with internally positioned single-unit connector means to connect external connecting leads on the one hand and coil winding ends on the other; stepped diameter, but radially continuous, fitting openings in the plastic bracket, into which connector sleeves are inserted and fixed in place as connector means; around one end of each connector sleeve, projecting from the internal operating side of the plastic bracket, the coil winding ends are wound, while in the other end of each connector other sleeve the insulated ends of the external operating lines are inserted from the external operating side of the plastic bracket in order to make contact, further characterized by:

(a) the fitting openings each possess an offset, reduced inside diameter in the vicinity of the external operating side of plastic bracket;

(b) the connector sleeves are inserted from the internal side of the plastic bracket into a first plurality of fitting opening mating part each having a greater inside diameter until each mates with a second plurality of fitting opening mating parts each having a lesser inside diameter; and

(c) the plastic bracket is hinge-mounted by a plastic hinge on the one end flange and can be swivelled back laterally away from the winding compartment for the connector sleeves to make contact with the winding ends of the coil; and can be swivelled back over the winding compartment and locked into place with the other end flange.

4,649,362

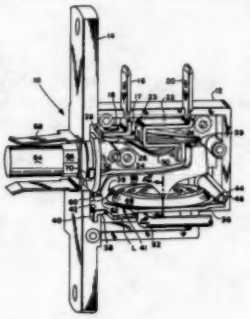
THERMOSTAT

Donald W. Fries, Carol Stream, and David W. Trosciuski, Woodridge, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 5, 1985, Ser. No. 772,970

Int. Cl.[4] H01H *37/12, 35/40*

U.S. Cl. 337—323 **15 Claims**



1. An improved thermostat comprising:

(a) base frame means;

(b) plate means cantilevered from said base frame means;

(c) expansible wall means mounted on said plate means defining therewith a fluid chamber;

(d) conduit means defining a fluid port in said plate means and communicating with said chamber, said conduit means adapted for external fluid pressure communication therewith;

(e) lever means pivoted on said base frame means and having a force transmitting surface thereof contacting said expansible wall means;

(f) means adjustably positioning the free end of said plate means with respect to said base frame means;

(g) cam means operative to adjustably position said lever means with respect to said base frame means;

(h) switch means having an actuator member contacting said lever means, wherein said cam means is operable to vary the position of said lever means and the actuation point of said switch means; and,

(i) temperature sensing means connected to said conduit means and operative to provide fluid pressure changes in said chamber in response to sensed temperature changes.

4,649,363

SENSOR

James B. Starr, St. Paul, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 22, 1985, Ser. No. 757,715

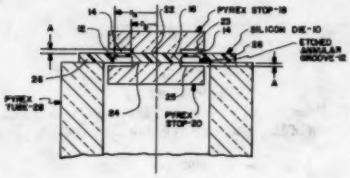
Int. Cl.[4] G01L *10/22*

U.S. Cl. 338—4 **8 Claims**

1. A sensor, comprising:

a die having a central region, a flexible annular sensing portion surrounding the central region, and a peripheral support structure supporting the flexible annular sensing portion; and

means attached to the central region of the die for limiting the extent of movement of the central region in each of



two opposite directions by such means encountering the peripheral support structure.

4,649,364

BIFUNCTIONAL ENVIRONMENT SENSOR

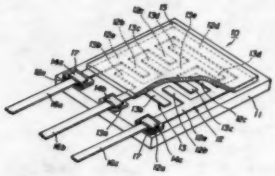
Maki Tanahashi, Kyoto; Sumio Horiike, Ohtsu, and Hiroyuki Nakano, Osaka, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Sep. 18, 1984, Ser. No. 651,869

Claims priority, application Japan, Sep. 20, 1983, 58-175042

Int. Cl.[4] H01C *7/00*

U.S. Cl. 338—14 **11 Claims**



1. An environment sensor comprising:

(a) an insulating base board;

(b) a first electrode made of a material which can provide a first electrical indication of the value of a first physical quantity, formed on said insulating base board;

(c) a second electrode formed of electrically conducting material and formed on said insulating base board; and

(d) a mass of metal oxide semiconductor material which can provide a second electrical indication of the value of a second physical quantity essentially simultaneously with said first electrical indication, layered on said base board over said first and second electrodes.

4,649,365

PLATINUM RESISTOR FOR THE MEASUREMENT OF TEMPERATURES

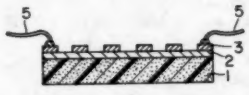
Hisatoshi Furubayashi, Yamatokoriyama; Hiroki Tabuchi, Nara, and Masaya Hijikigawa, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Feb. 4, 1986, Ser. No. 825,865

Claims priority, application Japan, Feb. 6, 1985, 60-22540

Int. Cl.[4] H01C *3/04*

U.S. Cl. 338—25 **2 Claims**



1. A platinum resistor for the measurement of temperatures comprising a silicon substrate, an aluminum oxide film formed on said silicon substrate, and a platinum film formed on said aluminum oxide film.

4,649,366

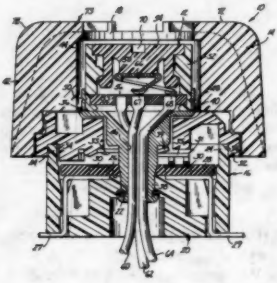
TRIMMER CONTROL MOUNTED IN POTENTIOMETER KNOB

Gerald H. McDonald, Coon Rapids, Minn., assignor to Resistance Technology, Inc., Minneapolis, Minn.

Filed Oct. 4, 1985, Ser. No. 784,332

Int. Cl.[4] H01C *10/16*

U.S. Cl. 338—134 **7 Claims**



1. A device comprising:

a first variable resistor having a rotatable knob with a chamber located within the knob;

a second variable resistor disposed within the chamber;

means for anchoring the second variable resistor within the chamber such that the first and second variable resistors are adjustable independently of each other.

4,649,367

ELECTRIC POTENTIOMETER

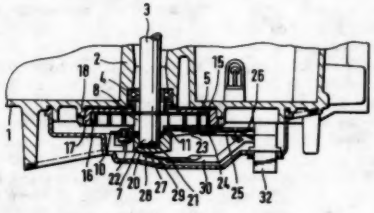
Eberhard Biermann, Uhldingen; Heinz Rilling, Eberdingen, and Peter Romann, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 18, 1985, Ser. No. 713,056

Claims priority, application Fed. Rep. of Germany, May 15, 1984, 8414799[U]

Int. Cl.[4] H01C *1/02, 10/00*

U.S. Cl. 338—184 **2 Claims**



1. An electric potentiometer mounted on a wall of an intake pipe of an internal combustion engine, said electrical potentiometer including a resistance path disposed generally parallel to a mounting plate, an elongated plug made as an injection molded plastic part and having equally spaced prongs embedded in said plastic part and electrical connecting contacts, partially embedded in the plastic connected to said prongs, characterized in that said elongated plug is connected with an exterior wall surface of said intake pipe with said prongs extending in an outward direction relative to said intake pipe and

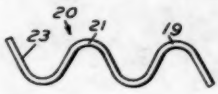
the connecting contacts extend generally perpendicularly to said contact prongs.

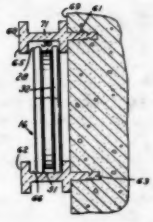
4,649,368

ELECTRICAL RESISTANCE HEATING ELEMENT

Lorne A. Best, West Bloomfield, Mich., assignor to National Element, Inc., Troy, Mich.

Filed Jun. 3, 1985, Ser. No. 740,717
Int. Cl.[4] H01C *3/00, 3/10, 7/22;* H05B *3/10*
U.S. Cl. 338—283 **13 Claims**





1. An electrical resistance heating element for use in a high temperature electrical furnace, said furnace having upper and lower supports arranged in a pattern into which said element is positioned for providing proper heat distribution, said resistance element comprising:

an elongated continuous metallic ribbon bendable into a series of continuous segments, said segments being positionable within the upper and lower supports;

each of said continuous segments being generally U-shaped having a curved end section and two generally straight side sections all lying in a first plane, said end section having a cross-sectional configuration substantially similar to the cross-sectional configuration of each of said straight side sections, whereby said ribbon has the same cross-sectional configuration along its entire length;

said cross-sectional configuration at any place along the entire length of the ribbon being curved in a second plane perpendicular to said first plane to provide stiffness and strength to said ribbon.

4,649,369

APPARATUS FOR DETERMINING THE POSITION OF A FIFTH WHEEL ON A MULTI-AXLE VEHICLE

Robert L. Walker; Dale A. Crowe, both of Yakima, and Paul D. Lund, Union Gap, all of Wash., assignors to Partnership of Robert Walker and Paul Lund, Yakima, Wash.

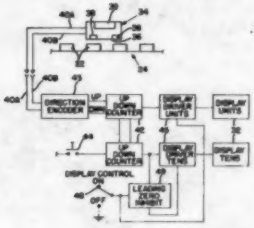
Filed Sep. 13, 1985, Ser. No. 775,615
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 340—52 R **6 Claims**

1. An apparatus for identifying the position of the movable plate portion of a fifth wheel apparatus useful on a multiple axle vehicle relative to the fixed rail portion thereof to which the movable portion can be locked, the apparatus comprising:

means for recognizing successive lockable positions of said movable portion relative to said fixed portion;

means for counting the successively recognized positions as said movable portion and said fixed portion move relative to each other; and

means for setting said counting means to a known base value when said movable portion of the fifth wheel apparatus is



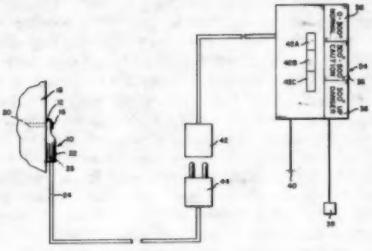
in a known position relative to said fixed portion, so that the relative position of the movable portion and the fixed portion is known during relative movement of the fixed portion and the movable portion.

4,649,370

BRAKE CONDITION INDICATOR

Linda R. Thomason, 2744 W. Hillside Ave., Denver, Colo. 80219

Filed Jun. 15, 1984, Ser. No. 621,165
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 340—52 B **17 Claims**



1. A temperature indicator adapted for use with a brake system including a brake drum or rotor and a brake shoe having a backing plate and a friction lining mounted on the backing plate, the friction lining material possessing a first surface for selective frictional engagement with the brake drum or rotor, a second surface for interfacing engagement with the backing plate, and a third surface, said temperature indicator comprising:

heat conductive means for penetrating into the third surface of the friction lining without damaging or modifying the structure of the brake shoe to create intimate and direct heat conductive contact with the friction lining;

a conductive metal member engaging said heat conductive means, said heat conductive means attaching said metal member to the third surface;

thermocouple wire engaging said metal member at one end of said wire; and

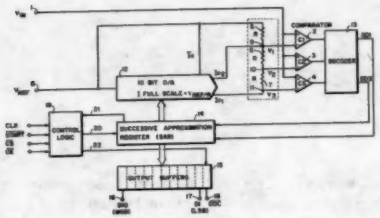
a pyrometer gauge engaging said thermocouple wire at the other end of said wire.

4,649,371

MULTI-STEP PARALLEL ANALOG-DIGITAL CONVERTER

Madhavprasad V. Kolluri, Santa Clara, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Feb. 15, 1984, Ser. No. 580,410
Int. Cl.[4] H03M *1/00*
U.S. Cl. 340—347 AD **18 Claims**



1. A successive approximation A/D converter comprising:
an input terminal for receiving an analog signal voltage to be converted into a corresponding digital representation, a switchable current source having first and second output current lines, a resistor chain voltage divider coupled to said switchable current source output lines for developing a plurality of reference voltages that subdivide the input voltage signal range into a plurality of voltage subranges, means coupling a source of reference voltage to said switchable current source and to said voltage divider, means for comparing said resistor chain reference voltages with the analog signal voltage at the input terminal thereby to derive a plurality of control signals indicative of the voltage subrange which contains the analog voltage at the input terminal, a decoder having input means responsive to said derived control signals to develop at least first and second binary control signals which represent first and second digits of the digital signal corresponding to the analog input voltage at the input terminal, means responsive to said decoder first and second binary control signals for controlling said switchable current source so as to readjust the currents in said output lines in a manner determined by said first and second binary control signals whereby the resistor chain develops a second plurality of reference voltages indicative of a second narrower voltage subrange which contains the analog voltage at the input terminal, means for storing said first and second binary control signals, and a control logic device responsive to a start signal and having output means coupled to said controlling means for initiating a conversion cycle of the A/D converter and for providing control pulses thereto to control its operation.

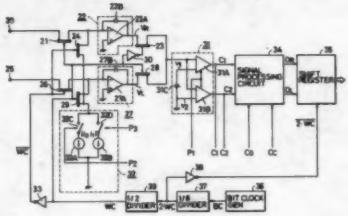
4,649,372

ANALOGUE TO DIGITAL CONVERTER

Miki Abe, Yokohama, and Tadao Suzuki, Meguro, both of Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP83/00090, § 371 Date Nov. 25, 1983, § 102(e) Date Nov. 25, 1983, PCT Pub. No. WO83/03501, PCT Pub. Date Oct. 13, 1983
PCT Filed Mar. 25, 1983, Ser. No. 556,710
Claims priority, application Japan, Mar. 25, 1982, 57-47607
Int. Cl.[4] H03K *13/02*
U.S. Cl. 340—347 NT **4 Claims**

1. An analogue to digital converter comprising:
first and second switching means for sampling alternately first and second analogue signals presented to first and second input terminals, respectively,
first and second integrators connected to first and second switching means for continuously receiving one or the other of said analogue signals, said first and second integrators being alternately operative to receive the analogue signal which is being sampled,
constant current generating means,
third switch means, connected to said constant current generating means and to said first and second integrators for supplying a constant current continuously to one or the other of said first and second integrators, and alternately to said first and second integrators,
a comparator means for comparing output voltages of said first and second integrators with a reference potential,
digital signal generator means connected with said comparator means and responsive thereto for generating a digital



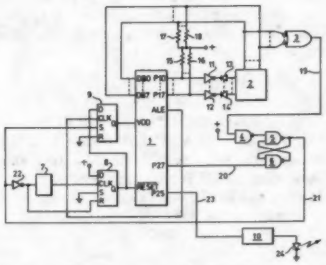
signal corresponding to each period beginning when said constant current generator means commences supplying constant current to either one of said first and second integrators and ending at the instant at which the output voltage of said one of first and second integrators reaches the level of said predetermined voltage, and
switch control means connected to said third switching means for controlling the same to contact said constant current generating means alternately to said first and second integrators during each period in which an input analogue signal is supplied to the other one of said first and second integrators.

4,649,373

POWERED CONSERVATION SYSTEM IN BATTERY POWERED KEYBOARD DEVICE INCLUDING A MICROPROCESSOR

Patrick M. Bland, Delray Beach, and William H. Bolt, Deerfield Beach, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 10, 1983, Ser. No. 522,061
Int. Cl.[4] G09G *3/00*; G06F *1/00*
U.S. Cl. 340—365 R **4 Claims**



1. A battery powered keyboard device comprising a battery, a matrix keyboard having drive lines, sense lines orthogonal to the drive lines and keys at intersections of the drive and sense lines for coupling corresponding drive and sense lines when depressed, said sense lines being coupled to said battery for providing a high potential on said sense lines with no keys

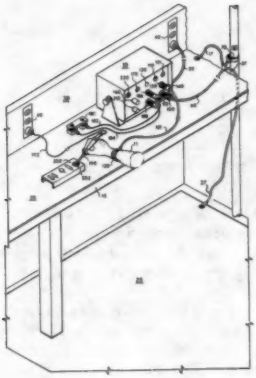
depressed and a low potential on a sense line coupled to a depressed key, a microprocessor having an output port coupled to said sense lines, an output line for carrying output signals generated by the microprocessor in response to sense line signals at said input port, and a low power standby mode input energizable to switch the microprocessor from a low power standby condition to a powered condition, an infra-red light emitting device coupled to be driven from said output line, and a power conservation system comprising a NOR circuit having a plurality of inputs each coupled to an associated one of said sense lines and responsive to a change from said high to said low potential on any of said sense lines to generate a first signal, second means responsive to said first signal for energizing said low power standby mode input of the microprocessor to power up the microprocessor for driving said drive lines through said output port, said second means being responsive to a microprocessor output signal indicating completion of processing of all sense signals received from said sense lines at the input port in response to the driving of the drive lines to de-energize the low power standby mode input and thereby return the microprocessor to said low power standby condition.

4,649,374

ELECTROSTATIC SYSTEM MONITOR AND METHOD THEREFOR

Jan C. Hoigaard, Colorado Springs, Colo., assignor to Spectrascan, Inc., Colorado Springs, Colo.

Filed Jan. 6, 1984, Ser. No. 568,604
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—573 **24 Claims**



1. An electrostatic system monitor for monitoring the operation of static control equipment located at a user's workstation, said static control equipment including (a) conductive surfaces such as a conductive workbench mat and a conductive floor mat, (b) a grounded tip soldering iron, and (c) a conductive wrist strap on the wrist of a user, said conductive surfaces and said wrist strap being connected to ground connection, said monitor and soldering iron being connected to electrical AC power having an electrical ground, said electrostatic system monitor comprising:

means connected to said ground and to said electrical ground for continuously sensing the low impedance continuity between said ground and said electrical ground, said sensing means being capable of issuing a loss-of-continuity signal in the event said low impedance exceeds a predetermined resistance value,

means responsive to the manual contact with said conductive wrist strap for determining the resistance of said conductive wrist strap, said determining means being capable of producing (a) a safe resistance signal when the determined resistance is in a predetermined resistance range, (b) a loss-of-resistance signal when the determined resistance is below said predetermined resistance range, and (c) a gain-of-resistance signal when the determined resistance is above said predetermined resistance range,

a surface resistance probe for detecting the surface resistance of said conductive surfaces when said probe is in contact with said surfaces,

means connected to said surface resistance probe for selectively measuring the conductivity of said conductive surfaces, said measuring means being capable of generating (a) an adequate conductivity signal when the surface resistance is in a predetermined resistance range, (b) an unsafe resistance signal when the surface resistance is below said predetermined resistance range, and (c) an inadequate conductivity signal when the surface resistance is above said predetermined resistance range, and

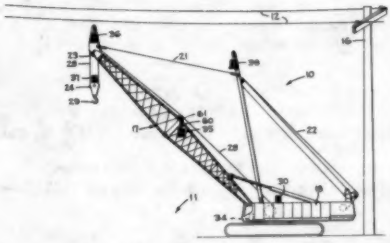
means responsive to a periodic manual contact with the tip of said soldering iron for detecting induced AC voltage, said detecting means being capable of producing an unsafe voltage signal when said induced AC voltage exceeds a preset voltage.

4,649,375

APPARATUS FOR DETECTING POWER LINES

Denis E. Duppong; Bernard L. McGrew, both of Cedar Rapids, and Ramsay P. Decker, Marion, all of Iowa, assignors to FMC Corporation, Chicago, Ill.

Filed Oct. 31, 1985, Ser. No. 793,394
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—660 **5 Claims**



1. Apparatus for detecting electrical power lines, for use with a crane having a boom mounted on an upper machinery works, said apparatus comprising:

a plurality of pickup coils for intercepting a magnetic field from said power lines;

means for mounting a first one of said pickup coils on said upper machinery works to provide a reference output signal representative of the strength of a magnetic field in an area about the upper machinery works;

means for mounting the remainder of said pickup coils on spaced portions of said boom to provide output signals from said remaining pickup coils when said remaining pickup coils approach a power line;

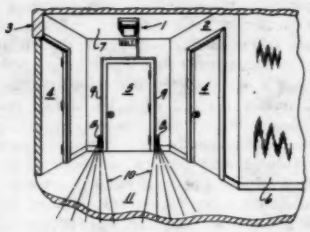
means for comparing said output signals from each of said remaining pickup coils with said output signal from said first pickup coil to determine when one of said remaining pickup coils is moved near a power line; and

means for providing a warning signal when an output signal from one of said remaining pickup coils exceeds said reference output signal by a predetermined value.

4,649,376
VISUAL FIRE ALARM APPARATUS

Richard Frank, 740 East Baypoint Rd., Milwaukee, Wis. 53217

Filed Jun. 19, 1984, Ser. No. 622,070
Int. Cl.[4] G08B 17/10
U.S. Cl. 340—691 10 Claims



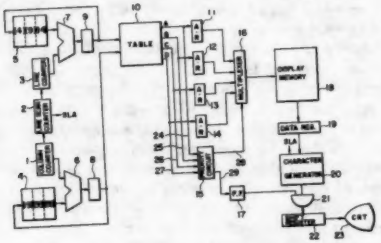
1. A smoke alarm system, comprising

a portable visual means having an outer housing having a back portion and a forward flat wall portion and inclined sidewalls to establish maximum forward projection of light to persons trapped by a fire within an enclosure, a smoke alarm detector mounted adjacent an upper portion of the enclosure, low voltage lead means connecting said alarm detector to actuate said visual means, said visual means including a high intensity lamp unit, said visual means being mounted in remote relationship to such detector unit so as to locate the high intensity light below the normal smoke level within the enclosure at advanced stages of combustion, a support unit within said housing for said visual means, a pulsed power supply means mounted to said support unit and connected to create bursts of light from said high intensity lamp unit at a frequency such that the pulses are readily distinguishable but are sufficiently close as to avoid any possibility that the illumination would be missed by a person's rapid review of the environment, and a low voltage D.C. battery means mounted on said support unit and connected to operate said supply means and said lamp unit.

4,649,377
SPLIT IMAGE DISPLAY CONTROL UNIT

Kiichiro Urabe, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 23, 1984, Ser. No. 613,379
Claims priority, application Japan, May 24, 1983, 58-90982
Int. Cl.[4] G09G 1/06
U.S. Cl. 340—721 4 Claims



1. A control unit for a display device having a display screen partitioned into a plurality of areas in the form of blocks for displaying a plurality of split images each consisting of one or more blocks, comprising:

block detection means for detecting one of said blocks in which a scanning location on the display screen is contained, including column split memory means for storing lateral block split positions on the display screen, line split memory means for storing longitudinal block split positions on the display screen, position information generation means for generating position information indicating the scanning position on the display screen, said block designation means for comparing the position information with the contents of said column split memory means and said line split memory means, respectively, and for generating a block designation signal to designate the block in which the scanning position is contained;

a display data memory for storing data to be displayed;

conversion means responsive to said block detection means for producing split image signals each indicating the split image to which the detected block belongs; and

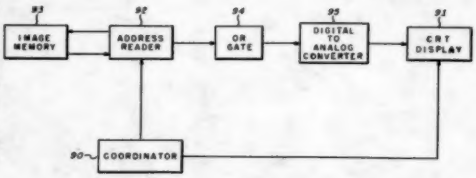
address control means responsive to the split image signals for generating a read address for said display data memory for each split image;

said display data memory being accessed by the read address.

4,649,378
BINARY CHARACTER GENERATOR FOR INTERLACED CRT DISPLAY

Michael J. Johnson, Phoenix, Ariz., and William R. Hancock, Bernalillo, N. Mex., assignors to Sperry Corporation, New York, N.Y.

Filed Nov. 18, 1983, Ser. No. 553,224
Int. Cl.[4] G09G 1/06
U.S. Cl. 340—728 17 Claims



1. An apparatus for expanding illuminated picture elements in video display means, comprising:

a matrix of picture elements, denoted $P_{X,Y}$; and means for illuminating said picture elements in response to applied signals;

means coupled to said video display means, for generating coordinate signals representative of the position of ones of said picture elements on said display means, and for synchronizing said illuminating means with said coordinate positions;

means for storing video bit signals, comprising a plurality of addressable storage locations, ones of said locations corresponding to said ones of said picture elements, each of said locations being identified by an x and a y binary coordinate, said video bit signals being stored only in said locations at addresses whose x coordinate has a predetermined first binary digit, and whose y coordinate has a predetermined first binary digit;

means, responsive to a signal from said coordinate signal generating means representing a generated coordinate $_{I,J}$, for reading said addressable storage locations corresponding to picture elements $P_{I,J}$, $P_{I-1,J}$, $P_{I-1,J+1}$, $P_{I,J+1}$;

means coupled to said means for reading addressable storage locations, for generating a Boolean OR sum digital signal from video bit signals read from said locations corresponding to picture elements $P_{I,J}$, $P_{I-1,J}$, $P_{I-1,J+1}$, and $P_{I,J+1}$; and

means, coupled to said Boolean OR sum digital signal generating means and said video display means, for generating, in response to a zero digital signal, a first analog signal,

and for generating, in response to a one digital signal, a second analog signal,

said picture element $P_{I,J}$ being illuminated by said illuminating means of said video display means, in response to said second analog signal, and said picture element $P_{I,J}$ being unilluminated by said illuminating means in response to said first analog signal.

4,649,379

DATA DISPLAY APPARATUS WITH CHARACTER REFRESH BUFFER AND ROW BUFFERS

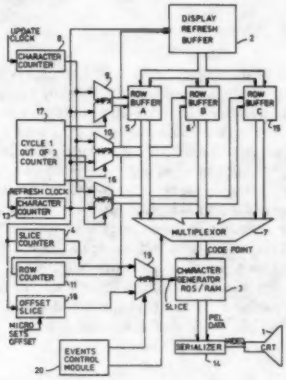
David A. Canton, Romsey; Brian L. Holloway, Winchester; Nicholas B. Sargeant, Eastleigh, and Roger J. Llewelyn, Winchester, all of England, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Sep. 28, 1984, Ser. No. 656,105

Claims priority, application European Pat. Off., Sep. 28, 1983, 83305854.8

Int. Cl.⁴ G09G *1/16*

U.S. Cl. 340—750 **5 Claims**



1. Data display apparatus for displaying data on the screen of a raster-scanned cathode ray tube (1) comprising a refresh buffer (2) adapted to contain character codes representing alphanumeric characters or other symbols to be displayed, a character generator (3) adapted to contain bit patterns corresponding to said characters or symbols to be supplied to said cathode ray tube, first and second character row buffers (5, 6) for storing successive rows of characters or symbols to be displayed on said cathode ray tube, and means (7 to 11 and 13) for loading character codes into one row buffer as another row buffer is addressing said character generator to access bit patterns therein, characterized in the provision of a third row buffer, (15), and means for causing either, or intermixedly, both of any two of the row buffers to access the character generator while the other of the three is being loaded from the refresh buffer whereby the bit pattern for a particular raster scan line can be derived by accessing said character generator by one or two of said row buffers.

4,649,380

VIDEO DISPLAY SYSTEM COMPRISING AN INDEX STORE FOR STORING REDUCED VERSIONS OF PICTURES TO BE DISPLAYED

David E. Penna, Redhill, England, assignor to U. S. Philips Corporation, New York, N.Y.

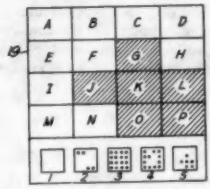
Filed Jun. 11, 1984, Ser. No. 618,977

Claims priority, application United Kingdom, Jun. 15, 1983, 8316268

Int. Cl.⁴ G09G *1/14*

U.S. Cl. 340—750 **5 Claims**

1. A video display system comprising a data processor connected by a communication bus whereto there are also connected a display memory, a video generator and a main memory, said display memory being provided for storing, in digital form, video information of an image to be displayed, said video generator being provided for producing video signals from said video information, said video generator having an output connected to a display device for displaying said image by means of pixels in a static display frame, the transfer of said video information from said display memory to said video generator being controlled by said data processor, which also comprises input means for receiving pages of information supplied from outside the system and being provided for controlling the storage of received pages into the main memory, said data processor being further provided with indexing means for generating indexing information of a received page by reducing the scale of a received page in order to form a



miniature *aide memoire* version of that received page, said indexing means being also provided for storing said indexing information into an index store and for annexing an indicator to said indexing information indicating the location in said main memory wherein the page, upon which said *aide memoire* version was generated, is stored, said index store having a capacity for storing at least one index page comprising a plurality of said *aide memoire* versions, said data processor being provided for controlling the transfer of an index page from said index store to said display memory in order to display said index page as an image on said display device, said system further comprises selection means for selecting one of the indexing information of the displayed index page, said selection means being provided for enabling, by using the indicator of the selected index information, the transfer of the selected page from said main memory to said display memory.

4,649,381

LIQUID CRYSTAL PANEL DISPLAY DEVICE

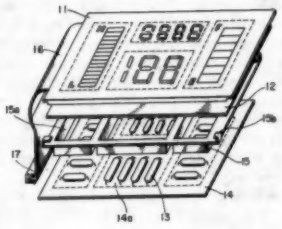
Mitsuhiro Masuda; Osamu Igarashi; Keiichi Tokuyama, and Kozo Katogi, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 25, 1984, Ser. No. 664,772

Claims priority, application Japan, Oct. 28, 1983, 58-202206

Int. Cl.⁴ G09G *3/36*

U.S. Cl. 340—784 **4 Claims**



1. A liquid crystal panel display device comprising:

a liquid crystal panel having a relatively large area and

having at least two display blocks, said liquid crystal panel having a front face and a rear face;

a diffusion plate having a front face disposed opposing the rear face of said liquid crystal panel for diffusing received light rays, said diffusion plate having a rear face;

a board disposed opposing the rear face of said diffusion plate;

a reflection plate disposed between said diffusion plate and said board for partitioning spaces corresponding to respective ones of said at least two display blocks of said liquid crystal panel; and

a plurality of light emitting members disposed in equally spaced relation to each other on said board over the whole region of said liquid crystal panel, at least three of said light emitting members being disposed side by side in equally spaced relationship to each other within a space partitioned by said partitioning reflection plate, said at least three light emitting members extending perpendicularly to a longitudinal direction of the space partitioned by said partitioning reflection plate, each of said light emitting members comprising an incandescent lamp.

4,649,382

ELECTROCHROMIC DISPLAY EMPLOYING POTENTIOSTATIC ERASURE

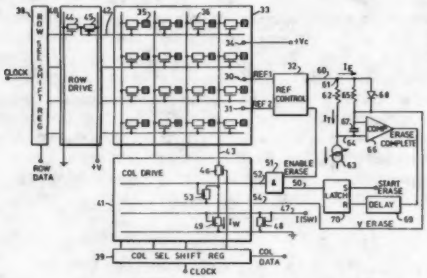
David H. Martin, Eastleigh, and Raymond A. Spanner, Waltham Chase, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,505

Claims priority, application European Pat. Off., Jun. 30, 1983, 83303794.8

Int. Cl.⁴ G09G *3/34*

U.S. Cl. 340—785 **7 Claims**



1. In an electrochromic display having a plurality of individually addressable display electrodes, counter electrode means and reference electrode means, all in contract with an electrolyte; addressing means for defining subsets of the display electrodes and providing electrical connections thereto;

write drive means, cooperable with the addressing means in response to a write command, to pass current between addressed display electrodes and the counter electrode means so as to write an image or a portion thereof;

and potentiostatic erase drive means, cooperable with the addressing means in response to an erase command, to pass erase current between addressed display electrodes and the counter electrode means until the addressed display electrodes reach a predetermined potential with respect to the reference electrode means so as to erase any image on those electrodes, the improvement to said display comprising:

erase completion detection means arranged to monitor said erase current supplied by said potentiostatic erase drive means and to terminate said erasure operation on the occurrence of a fall in erase current corresponding to completion of the erasure of the addressed display electrodes.

4,649,383

METHOD OF DRIVING LIQUID CRYSTAL DISPLAY DEVICE

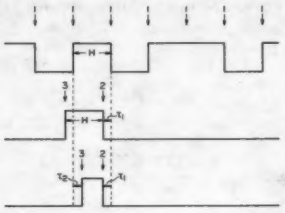
Makoto Takeda; Keisaku Nonomura, and Fumiaki Funada, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 29, 1983, Ser. No. 566,795

Claims priority, application Japan, Dec. 29, 1982, 57-230978

Int. Cl.⁴ G09G *3/00*

U.S. Cl. 340—805 **10 Claims**



1. A method of driving a matrix type liquid crystal display device including a liquid crystal picture forming element at the intersection of each line electrode and column electrode and where each liquid crystal element is provided with a thin film transistor connected to the row electrode and the column electrode, comprising the steps of:

(a) applying a scanning signal pulse to the line electrode; and

(b) applying a data signal pulse to the column electrode where the scanning signal pulse is advanced in time with respect to the data signal pulse, the advancement in time of the scanning signal pulse being determined in accordance with a resistor-capacitor time constant associated with a capacitance formed by the liquid crystal element and the line electrode and a resistance of the line electrode.

4,649,384

METHOD AND APPARATUS FOR FAULT TOLERANT SERIAL COMMUNICATION OF DIGITAL INFORMATION

Stephen J. Sheafor, Santa Clara, and Ken K. S. Weng, Sunnyvale, both of Calif., assignors to Dialogic Systems Corp., San Jose, Calif.

Filed Oct. 7, 1983, Ser. No. 540,267

Int. Cl.⁴ H04Q *9/00*

U.S. Cl. 340—825.03 **12 Claims**

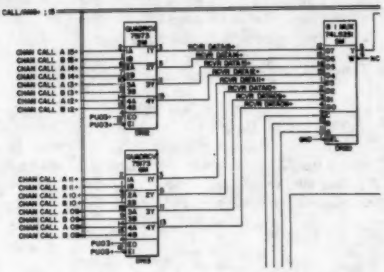
1. A method for digital information communication whereby at least one of a plurality of information processing elements is coupled to at least one other of the plurality of information processing elements, comprising the steps of:

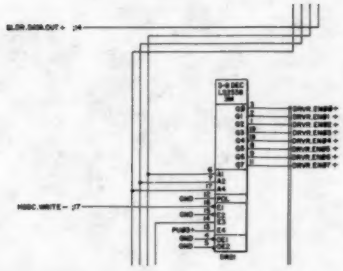
interfacing each of the plurality of information processing elements to a plurality of coupling means;

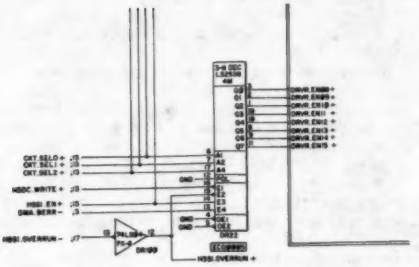
exchanging digital information in the form of messages among a plurality of communication controller means under control of the plurality of communication controller means, at least certain of the messages exchanged among the plurality of communication controller means being for control of the exchange of digital information in the form of data among the plurality of coupling means for use by the plurality of information processing elements; and

connecting the plurality of coupling means and communication controller means to a plurality of four-wire, full duplex communication circuits for transferring digital information among the plurality of coupling means and com-

munication controller means, respectively, in bit-serial format;







whereby high throughput fault tolerant digital information communication in serial format is provided.

4,649,385

ELECTRONIC LOCATING SYSTEM FOR PERSONS RECEIVING TELEPHONE CALLS

Ramon H. Aires, Granada Hills; Charles A. Clark, Jr., Chatsworth; Roy A. Ito, Woodland Hills, all of Calif., and Kenneth R. Hackett, Boulder, Colo., assignors to Teloc R & D Ltd., Broomfield, Colo.

Continuation-in-part of Ser. No. 407,883, Aug. 13, 1982, abandoned. This application Jul. 26, 1983, Ser. No. 517,321

Int. Cl.[4] H04Q *7/00*

U.S. Cl. 379—57 **33 Claims**

1. The method of determining the present location of a member of a defined class of individual units the present location of which is not known from among a large population of individual units, each programmed to respond to a predetermined inquiry signal, which are normally distributed throughout a defined facility comprising the steps of:

receiving at a central station a request to establish the present location of one of said individual units;

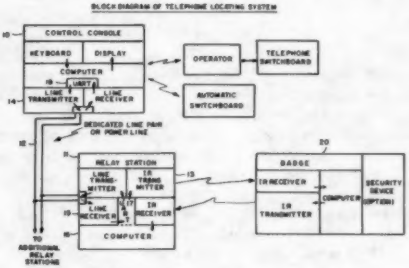
establishing a two-way communication channel between said central station and a plurality of spaced relay stations, each relay station including a transmitter and a receiver and said relay stations being located so as to be cumulatively capable of substantially covering said facility with infrared energy;

communicating by a message coded for selecting said one individual unit over said channel with said plurality of relay stations;

causing said relay stations to transmit an inquiry signal by said infrared energy and enabling the receiver of said one or more relay stations for a predetermined time period following each such transmission;

receiving the inquiry signal at each of said individual units that is located within the coverage of said one or more relay stations;

transmitting a radiant energy acknowledgment signal from



any individual unit which recognizes the inquiry signal received from a relay station to be the coded message to which it is programmed to respond;

receiving said acknowledgment signal at any of said relay stations within range of the radiant energy acknowledgment signal transmission;

transitting to said central station over said channel from any relay station which receives said acknowledgment signal an identification signal which identifies that relay station; and

utilizing at said central station any identification signal received from a relay station to determine the location of said relay station and hence the approximate location of the individual unit which transmitted said acknowledgment signal, said utilizing including, if more than one identification signal is received, repeating transmission of said inquiry signal at reduced signal level by any relay stations which responds with an identification signal to identify the relay station responsive to the lowest signal level.

4,649,386

DATA ACQUISITION

Robert E. McGregor, and Thomas J. Hubbard, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 29, 1983, Ser. No. 518,589

Int. Cl.[4] G08C *19/00*

U.S. Cl. 340—870.24 **14 Claims**

1. Apparatus comprising:

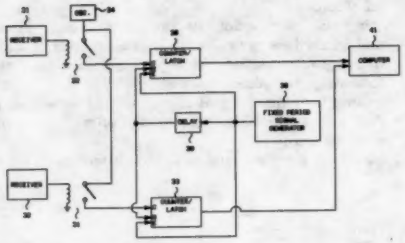
means for generating a first pulse duration type signal wherein said first pulse duration type signal is periodically repeated every time period p, wherein said first pulse duration type signal is in a first state for a portion of said time period p and is in a second state for a portion of said time period p, wherein the length of time said pulse dura-

tion type signal is in said first state is representative of the value of a first variable and wherein said first pulse duration type signal is continuous;

means for converting said first pulse duration type signal to a first clock signal when said first pulse duration type signal is in said first state;

a first counter having a count input and an enabling input;

means for supplying said first clock signal to the count input of said first counter;



means for supplying a fixed period signal having a period equal to said time period p to the enabling input of said first counter, wherein the count reached by said first counter in a time period equal to said time period p is representative of the time said first pulse duration type signal is in said first state;

a computer; and

means for transferring the count reached by said first counter to said computer to thereby transfer to said computer the value of said first variable.

4,649,387

METHOD AND APPARATUS FOR INVESTIGATING AIRFLOW

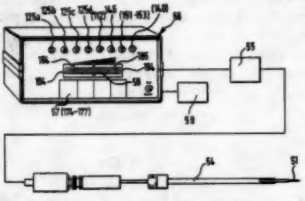
John M. Maris, London, England, assignor to Marinvent Corporation, Toronto, Canada

Continuation-in-part of Ser. No. 538,255, Oct. 3, 1983, Pat. No. 4,563,684, which is a continuation-in-part of Ser. No. 219,188, Dec. 22, 1980, Pat. No. 4,435,695. This application Oct. 8, 1985, Ser. No. 785,423

Claims priority, application United Kingdom, Dec. 24, 1979, 7944397

Int. Cl.⁴ G08B *23/00*

U.S. Cl. 340—966 **2 Claims**



1. Apparatus for investigating the airflow over an external surface of an aircraft, comprising:

means for sensing air speed over the surface at a predetermined location spaced from the surface to thereby produce input signals representative of the average airspeed at said location and of air speed fluctuations at said location, said fluctuations being caused by air turbulence at said location;

means for using said input signals to produce the signal representative of the ratio of said air speed fluctuations to said average air speed;

means for using said signals to produce a signal representative of said average air speed;

means for using said input signals to produce a signal representative of said air speed fluctuations; and

indicating means for indicating said ratio, said air speed fluctuations and said average air speed.

4,649,388

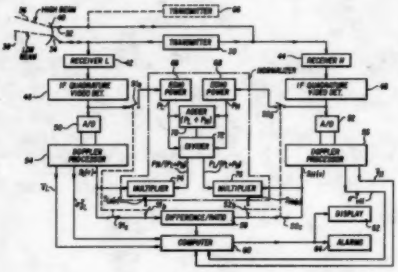
RADAR DETECTION OF HAZARDOUS SMALL SCALE WEATHER DISTURBANCES

David Atlas, 7420 Westlake Ter., Bethesda, Md. 20817

Continuation-in-part of Ser. No. 796,086, Nov. 8, 1985, abandoned. This application Dec. 23, 1985, Ser. No. 812,442

Int. Cl.⁴ G01S *13/95*

U.S. Cl. 342—26 **47 Claims**



21. A radar method of detecting hazardous weather phenomena associated with rapidly descending events such as a downburst and which comprises the steps of:

radiating at least one beam sufficiently large in vertical breadth to illuminate the aras encompassed by a plurality of vertically displaced receiving beams from an antenna scanned in azimuth toward a region of scatterers;

receiving the echo powers from said plurality of beams, said echo powers being representative of the average reflectivity of the scatterers in said beams;

determining the measure of the relationship between the echo powers between said beams at successive elevations at all range bins of a radar system, said relationship providing information representative of the vertical profile of average reflectivity of weather phenomena detected by said radar system;

storing a sequence of said measures for successive scans of said antenna;

determining the time difference of said measures; and

generating a time history of said measures, thereby providing an early indication of rapidly changing reflectivities and profiles associated with a descending downburst and providing a changing pattern corresponding to an evolving downburst and other weather hazards.

4,649,389

STACKED BEAM RADAR AND TARGET HEIGHT MEASUREMENT EXTRACTOR ESPECIALLY FOR USE THEREIN

John W. Taylor, Jr., Baltimore, and Michael J. Hodges, Linthicum, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 27, 1984, Ser. No. 593,784

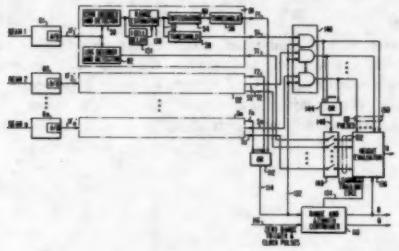
Int. Cl.⁴ G01S *13/48*

U.S. Cl. 342—123 **50 Claims**

14. A radar for detecting a target and computing measurements thereof, said radar including: an antenna assembly for generating a multiplicity of receive beams stacked in elevation; a transmitter for driving said antenna assembly to transmit radar pulses at a pulse repetition frequency (PRF) and with a

desired elevation coverage to illuminate targets within said stacked receive beams, the interpulse periods of said pulsed transmissions constituting range sweeps of said radar, said radar being operative to scan said pulsed transmissions and associated receive beams in azimuth and to receive echo pulses within the range sweeps as said stacked receive beams scan past objects in said elevation coverage; an echo pulse conditioning channel for each receive beam, each channel comprising: first means for discriminating between target and non-target echo pulses to generate a first signal over a range interval in a range sweep corresponding to an identified target echo pulse; second means for generating second signals in each range sweep from corresponding echo pulses which are identified as potential targets; and third means for extracting the amplitudes from the received echo pulses and generating third signals representative thereof; and computing means comprising:

means for establishing a set of range sweeps in azimuth for a



common identified target in accordance with said correspondingly generated first signals;

means for computing a target range measurement for said common identified target of said established set of range sweeps;

means for computing a target elevation angle for said commonly identified target of each range sweep of said established set based on a function of said correspondingly generated first, second and third signals associated therewith;

means for weighting each computed elevation angle of said range sweep set;

means for combining said set of weighted elevation angles to form a composite elevation angle for said range sweep set; and

means for computing a height measurement for said identified target of said established set of range sweeps based on factors including said formed composite elevation angle and computed target range measurement thereof.

4,649,390

TWO DIMENSION RADAR SYSTEM WITH SELECTABLE THREE DIMENSION TARGET DATA EXTRACTION

LaVern A. Andrews, Fullerton, and Dennis Moraitis, Yorba Linda, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

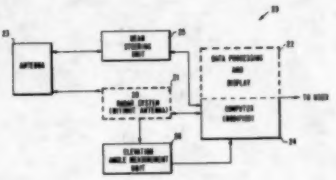
Filed Aug. 5, 1983, Ser. No. 520,408
Int. Cl.[4] G01S *13/42, 13/72*
U.S. Cl. 342—140 **17 Claims**

1. A radar system for a selectable three dimension or two dimension position indication of targets within the surveillance volume comprising:

an antenna adapted for selectively directing a fan beam and a narrow beam, wherein the narrow beam is scannable in elevation angle and has a narrower beamwidth in elevation angle than the fan beam;

a two dimension radar system coupled to the antenna for transmitting signals into the surveillance volume and for receiving reflected target signals from the antenna and for processing the reflected signals by means including at least one receiver for indicating the azimuth and range of the targets; and

an elevation angle measurement means coupled to the antenna and to the two dimension radar system for determining the elevation position of a selected target by selecting



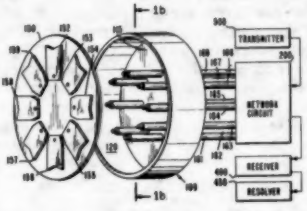
and sequentially lobing the narrow beam through a plurality of positions, and by receiving from the at least one receiver of the two dimension radar system reflected signals received from the selected target by the two dimension radar system during the scanning of the narrow beam and by processing those signals to indicate the elevation position of the selected target.

4,649,391

MONOPULSE CAVITY-BACKED MULTIPOLE ANTENNA SYSTEM

George I. Tsuda, Fullerton, and Charles R. Edelsohn, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 1, 1984, Ser. No. 576,078
Int. Cl.[4] G01S *13/44*; H01Q *21/26, 25/02*
U.S. Cl. 342—153 **28 Claims**



1. An antenna system comprising:

a substantially cylindrical cavity defined by a conductive enclosure and having a center axis;

N radiation elements comprising substantially identical, substantially planar, non-interleaved elements of a polygon shape arranged in a closely packed, substantially symmetrical configuration about the axis of said cavity and adapted for communicating right circularly polarized (RCP) and left circularly polarized (LCP) electromagnetic energy wherein N is no less than six; and

difference signal means coupled thereto for providing an antenna system difference pattern characterized by substantial symmetry in space about the antenna boresight.

4,649,392

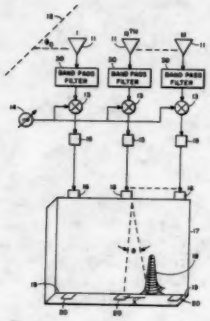
TWO DIMENSIONAL TRANSFORM UTILIZING ULTRASONIC DISPERSIVE DELAY LINE

John T. Apostolos, Merrimack, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Jan. 24, 1983, Ser. No. 460,216

Int. Cl.[4] G01S *3/72*; G01R *23/175*; H03H *9/44*

U.S. Cl. 342—192 **21 Claims**



1. A system for simultaneously determining the frequency spectrum and direction of arrival of incoming signals, said system comprising:

means for converting the incoming signals into acoustic energy;

a Lamb wave dispersive delay line whose input is coupled to the output of said converting means so that an interference pattern will travel through said delay line as a series of acoustic pulses;

means for converting the acoustic output of said delay line into electrical pulses;

whereby, the position of one of the electrical pulses along an edge of said delay line at a given time is related to the direction of arrival of one of the incoming signals and the time that said one electrical pulse exits said delay line determines the frequency of said incoming signal.

21. In an electronic surveillance system of the type in which a compressive receiver is used to obtain the frequency transform of a plurality of electromagnetic signals received by an array of linearly spaced radiation receivers, the improvement comprising:

a two dimensional dispersive delay line, having an input edge and an output edge, arranged to receive the plurality of electromagnetic signals at the input edge, thereby providing at the output edge, a plurality of pulses in which the relative position in time of a particular pulse indicates a component of the frequency transform of one of the electromagnetic signals and the relative spatial position of a pulse along the output edge indicates a component of the spatial transform of one of the electromagnetic signals.

4,649,393

PHASED ARRAY ANTENNAS WITH BINARY PHASE SHIFTERS

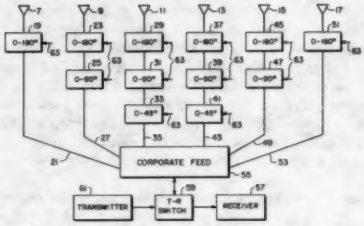
Otto E. Rittenbach, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 17, 1984, Ser. No. 581,496

Int. Cl.[4] H01Q *3/22, 3/02*; H03H *7/20*

U.S. Cl. 342—371 **8 Claims**

1. A steerable linear phased array antenna of the tapered type comprising a plurality of radiators, in which the energy applied to the center radiators is a maximum and the radiator energy is tapered off toward both ends of said array to reduce antenna pattern sidelobes, each of said radiators being provided with a binary digital phase shifter each comprising one or more elementary binary phase shifter stages connected in series, each of said phase shifter stages being capable of assuming either zero phase shift or 180° phase shift, or some submultiple of 180° which is an integral power of 2, whereby by selectively controlling the phase shifts of said elementary phase shifters, 2^n different total phase shifts may be obtained,



wherein "n" is the number of elementary phase shifter stages per antenna radiator, and wherein the said maximum energy center radiators are provided with a greater number of stages of said elementary phase shifters than are the lower energy radiators on either side thereof.

4,649,394

METHOD OF AND A DEVICE FOR RECOGNIZING TARGETS AND SUPPRESSING SPURIOUS SIGNALS IN RADAR EQUIPMENT

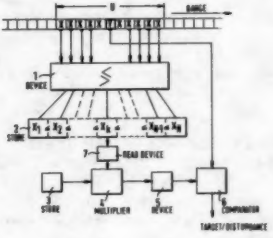
Manfred Minker, and Hermann Rohling, both of Ulm/Donau, Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 11, 1983, Ser. No. 483,722

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1982, 3213430; Jun. 24, 1982, 3223565; Jun. 24, 1982, 3223566

Int. Cl.[4] G01S *7/28*

U.S. Cl. 342—94 **20 Claims**

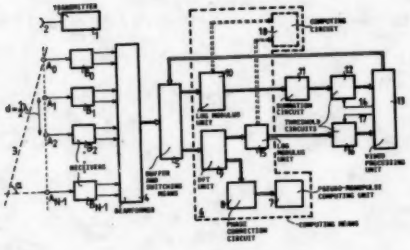


11. A device for recognising targets and suppressing spurious signals in radar equipment in which the surveillance area is divided, in azimuth and range, into a plurality of radar cells, said device comprising a comparator for comparing the echo signal of each said radar cell with a threshold value, a rank arranging device for arranging amplitude values of the echo signals of radar cells in a predetermined neighbourhood of the said radar cell to be compared with said threshold value, a one dimensional store for storing said arranged amplitude values, and means for reading the amplitude value stored in a specific store location for determining said threshold value.

4,649,395
PULSE RADAR APPARATUS

Bernard Gellekink, Ootmarsum, and Willem A. Hol, Hengelo, both of Netherlands, assignors to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Apr. 18, 1984, Ser. No. 601,524
Claims priority, application Netherlands, Apr. 20, 1983, 8301382
Int. Cl.[4] G01S 13/48
U.S. Cl. 342—158 6 Claims



1. A pulse radar apparatus comprising:

(a) a coherent transmitting and receiving unit including a transmitter and a transmitting antenna for the transmission of radar pulses, a vertical array of N receiving antennas and N receivers connected thereto for the reception of echo signals and the processing thereof in each of the receivers into two orthogonally phase-detected and digitized video signal components i_r and q_r, where r=0, 1, 2, . . . , N−1;

(b) a beamformer including N output channels (k) representing respective receiving beam patterns covering specific elevation intervals, where k=0, . . . , N−1, each output channel being adapted to derive from said components (i_r and q_r) the orthogonal components (I_k and Q_k) of a moving-target video signal P_k originating from the respective receiving beam pattern;

(c) a buffer and switching means electrically connected to the beamformer for selectively passing the orthogonal components (I_k and Q_k) of each output channel of the beamformer; and

(d) computing means electrically connected to the buffer and switching means;

characterized in that:

(1) the buffer and switching means is adapted to select two adjoining output channels (n and n+1) having orthogonal components (I_n, Q_n and I_{n+1}, Q_{n+1}) of moving-target video signals P_n and P_{n+1} with the maxium available amplitudes, and

(2) the computing means comprises a pseudo-monopulse computing unit for determining from the selected components of P_n, P_{n+1} the deviation in elevation $\Delta\alpha$ with respect to an elevation value α, which is the bisecting angle between the main beam directions α_n and α_{n+1} of the receiving beam patterns n and n+1, by using the relationship:

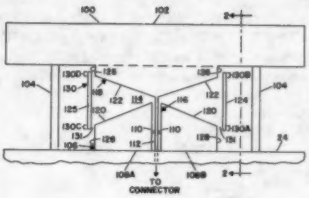
$$\frac{1}{\Delta\alpha} = C \cdot Re\left(\frac{P_n - P_{n+1}}{P_n + P_{n+1}}\right)$$

where C is a constant.

4,649,396
DOUBLE-TUNED BLADE MONOPOLE

Clifford H. Friedman, E. Northport, N.Y., assignor to Hazeltine Corporation, Commack, N.Y.

Filed Aug. 26, 1985, Ser. No. 769,119
Int. Cl.[4] H01Q 1/28, 9/38
U.S. Cl. 343—705 12 Claims



1. A blade monopole antenna comprising:

a dielectric slab;

ground means for establishing a ground plane;

a blade of conductive material mounted on a dielectric slab and spaced apart from said ground means and perpendicular thereto;

tuning means disposed between said blade and said ground means for tuning said antenna, said tuning means including a central conductive post with an upper portion connected to the blade and a lower portion coaxial with the upper portion and connected to the ground means, said lower portion having left and right sections forming a gap therebetween, said portions defining a radially tapered opening therebetween;

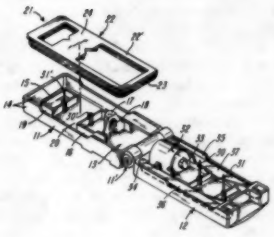
a transmission line mounted on the slab within the gap between the left and right sections of said lower portion in contact with said upper portion; and

means for supporting said slab perpendicular to said ground means.

4,649,397
THEFT DETERRENT TAG

Richard D. Heaton, Tipp City, and Steven C. Linton, Waynesville, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Apr. 8, 1985, Ser. No. 721,095
Int. Cl.[4] H01Q 1/36; G08B 13/00
U.S. Cl. 343—895 3 Claims



1. A theft deterrent tag adapted to be attached to an article to be protected, comprising: a housing including a pair of housing members, means for connecting the housing members to each other for movement between open and closed positions, means for securely releasably locking the housing members to each other in the closed position attached to an article to be protected so that the housing members cannot be moved to the open position except upon using a special unlocking device, one of the housing members having means defining a continuous loop passage, a board disposed in the passage, a

radio receiver-transmitter circuit including a coil, the coil being disposed on the board in the passage, a container for a liquid dye housed in the other housing member, and the container being readily frangible when the tag is attempted to be opening without releasing the locking means.

4,649,398

MOTOR DRIVEN EXTENSIBLE ROD ANTENNA FOR VEHICLES WITH POSITION CONTROL CIRCUIT

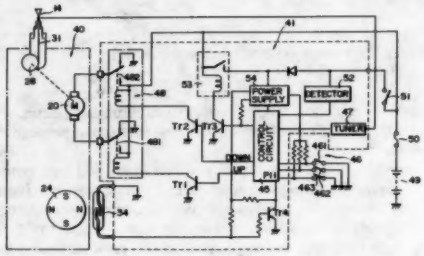
Akinori Yamamoto, Mie, and Masaaki Kurii, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 8, 1985, Ser. No. 689,813

Claims priority, application Japan, Jan. 25, 1984, 59-10242; Oct. 23, 1984, 59-223483

Int. Cl.⁴ H01Q *1/10*; G05B *19/29*

U.S. Cl. 343—903 **4 Claims**



1. An electric antenna apparatus for vehicles, comprising:

an antenna rod;

a rotary member for driving a cable coupled to said antenna rod, in the longitudinal direction of the antenna rod, and extending and retracting said antenna rod;

a motor, provided with an output shaft coupled thereto by a reducing mechanism constituted by a worm wheel, for rotating said rotary member;

pulse signal generating means placed in a non-contact state with said rotary member and including a rotation detecting plate rotatable coaxially with the worm wheel, said pulse signal generating means generating a pulse signal in response to the rotation of the rotation detecting plate, which takes place when said rotary member rotates in response to the extending or retracting of said antenna rod;

drive means provided with a control circuit to which the pulse signal generated by said pulse generating means is supplied and which drives and controls said motor so as to extend or retract said antenna rod;

antenna rod position signal setting means which is provided within the control circuit of said drive means and which counts the pulse signal generated from said pulse signal generating means and stores the count value corresponding to the position of said antenna rod;

stop position set instructing means for setting each stop position such as the fully-extending position, enclosed position, and middle position, etc., of said antenna rod;

pulse count value setting means for setting a pulse count value corresponding to each of said stop positions in response to a command from said stop position set instructing means;

operation command generating means which compares the pulse count value set in response to the command from said stop position set instructing means with the count value stored by said antenna rod position signal setting means, thereby generating an operation command for extending or retracting said antenna rod to said motor;

stop control means for generating a stop command to said motor when the pulse count value corresponding to said stop position coincides with said count value stored in said antenna rod position signal setting means; and

a circuit board into which the control circuit of said drive means is installed and which is located adjacent to said motor, said circuit board being provided with signal detecting means which constitutes said pulse signal generating means.

4,649,399

PEN RECORDER

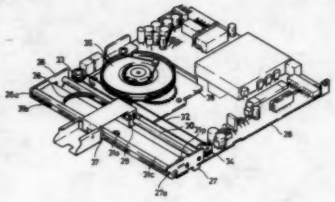
Toshio Kimura; Shuichi Nakagawa; Teruhiko Tokumo; Hiroyuki Yamamoto; Hiroshi Kotan; Hiroshi Otsu, and Tetsuya Satoh, all of Tokyo, Japan, assignors to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Mar. 3, 1986, Ser. No. 835,166

Claims priority, application Japan, Nov. 8, 1985, 60-250114

Int. Cl.⁴ G01D *9/04, 7/04*

U.S. Cl. 346—32 **10 Claims**



1. A pen recorder comprising

a pen carriage;

an automatic balancing mechanism for moving said pen carriage in a direction perpendicular to direction of movement of a recording paper, in response to magnitude of a measurement signal;

wherein said pen carriage and said automatic balancing mechanism are integrally incorporated in a common printed circuit board constituting at least one servo unit.

4,649,400

THERMAL PRINTER CONTROL DEVICE

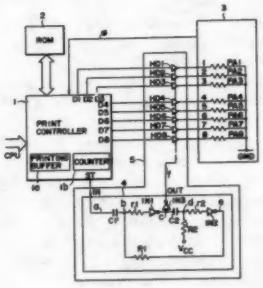
Yukio Naruki, and Takeshi Yasuda, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Nov. 14, 1985, Ser. No. 798,238

Claims priority, application Japan, Dec. 25, 1984, 59-195393[U]

Int. Cl.⁴ G01D *15/10*; B41J *3/20*

U.S. Cl. 346—76 PH **1 Claim**



1. A thermal printer control device, comprising:

thermal head means including thermal printing elements for imprinting lines of dot patterns to form a character on a recording medium;

print controlling means including means for outputting print

signals corresponding to the dot patterns of characters to be printed, means for outputting a print start signal of a certain duration corresponding to a time during which said thermal printing elements are to be energized in response to said print signals, means for counting to a determined count value after the output of the print start signal, and means for outputting a first print stop signal when said count value is attained by said counting means;

control circuit means for receiving the print start signal and the first print stop signal output from said print controlling means, and for outputting either of said first print stop signal or a second print stop signal in the absence of said first print stop signal from said print controlling means within a predetermined time after reception of the print start signal, so that a maximum energization time is established by the second print stop signal to prevent overheating of said printing elements; and

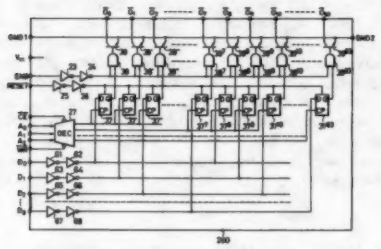
gate circuit means coupled between said thermal head means, and said print controlling means and said control circuit means, for enabling the supply of the print signals to said thermal head means in response to the print start signal, and for blocking the print signals from driving said thermal head means in response to either of said first or said second print stop signals.

4,649,401

THERMAL RECORDING APPARATUS

Yasuyuki Kojima; Nagaharu Hamada, both of Hitachi, and Yasuro Hori, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 7, 1985, Ser. No. 742,239
Claims priority, application Japan, Jun. 8, 1984, 59-116464
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **9 Claims**



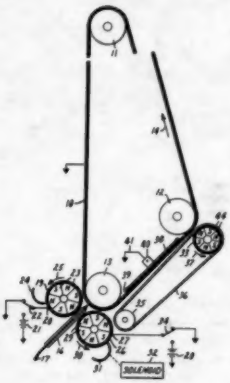
1. In a thermal recording apparatus of the type having a thermal recording head with a plurality of heating elements, a driver circuit actuated in response to a recording signal, and a control circuit which controls said driver circuit, the improvement comprising said control circuit including a circuit which inputs recording data, a microprocessor which effects control for transferring said recording data to said driver circuit, a ROM which stores programs to control the operation of said microprocessor, a RAM to store data to be transferred to said driver circuit, a circuit which controls the energization time for recording effected by said driver circuit, and means for outputting the recording dtat in said RAM to said driver circuit, so that the recording data in said RAM, a signal representing the corresponding address where said recording data has been stored, and a write signal transmitted to said driver circuit from said outputting means are output to said driver circuit in parallel in response to a data transfer acknowledge signal from said outputting means.

4,649,402

ELECTROGRAPHIC STYLUS RECORDING APPARATUS

George G. Lunde; Earl K. Hoyne, both of Fridley, and Charles K. Nordeen, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 7, 1986, Ser. No. 837,415
Int. Cl.[4] G01D *15/6*
U.S. Cl. 346—153.1 **4 Claims**



1. An improved electrographic stylus recording apparatus for use with magnetically attractable toner powder which includes a stylus array; a receptor recording belt for providing a recording region with the receptor recording belt adapted for movement past the stylus array; a toner powder applicator for applying toner powder to the receptor recording belt for providing toner powder to the recording region; toner powder collecting means downstream of the stylus for magnetically removing toner powder that is carried loosely on the recording belt, the toner powder collecting means including a cylindrical sleeve member adpated for rotation within which a magnetic field producing means is disposed, the cylindrical sleeve member being positioned near the receptor recording belt, the improvement providing transport of toner powder from the toner powder collecting means to the toner powder applicator including:

means providing for operation of the toner powder collecting means as a toner applicator for applying toner powder at the toner powder collecting means to the receptor recording belt as the receptor recording belt is moved, movement of the receptor recording belt returning the applied toner powder to the toner powder applicator.

4,649,403

RECORDING APPARATUS

Kunihiko Miura, Hiratsuka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 7, 1985, Ser. No. 731,560
Claims priority, application Japan, May 9, 1984, 59-94793
Int. Cl.[4] G01D *15/14*
U.S. Cl. 346—160 **6 Claims**

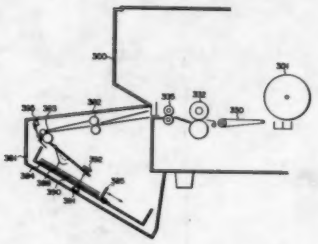
1. A recording apparatus for use with a host system comprising:

a housing having a manual feed port and a storage means for storing a plurality of recording media;

input means, mounted on said housing, for receiving from said host system first data associated with information to be recorded, second data associated with the selection of a manual feed mode or an automatic feed mode, and third data associated with a size of a recording medium for recording the information when the manual feed mode is selected;

image forming means, provided in said housing for forming an image on the recording medium corresponding to the information in accordance with the first data received from said input means;

feed means comprising manual feed means for conveying the recording medium manually fed from said manual feed port to said image forming means and automatic feed means for conveying the recording medium stored in the storage means to said image forming means, the feed



means selectively conveying the recording medium to the image forming means in accordance with the second data;

detection means for detecting said manual feed mode and the size of the recording medium on which the information is recorded in accordance with the second and third datum input from said input means; and

display means for displaying the manual feed mode and the size of the recording means on which the information is recorded in response to said detection means.

4,649,404

RECORDING APPARATUS

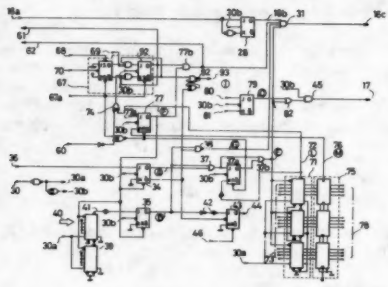
Morio Ohta, and Shizuo Tsuchiya, both of Higashiyamatoshi, Japan, assignors to Casio Computer Co., Ltd. and Casio Electronics Manufacturing Co., Ltd., both of Tokyo, Japan

Filed Oct. 28, 1985, Ser. No. 792,256

Claims priority, application Japan, Nov. 5, 1984, 59-232835

Int. Cl.[4] G01D *15/14*

U.S. Cl. 346—160 **17 Claims**



1. A recording device including a plurality of printing dot generating means arranged in a main scanning direction having recording electrodes and control means for controlling waveforms applied to said recording electrodes responsive to recording data applied from means external to said recording device, said recording device comprising:

(a) recording data processing means having an input for receiving said recording data and for controlling outputs applied to said control means;

(b) first input means for receiving reference clock pulses from said external means for processing said recording data; and

(c) second input means for receiving an effective recording data signal from said external means for indicating effective recording data.

4,649,405

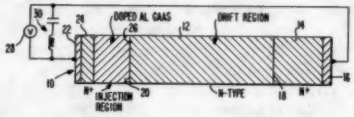
ELECTRON BALLISTIC INJECTION AND EXTRACTION FOR VERY HIGH EFFICIENCY, HIGH FREQUENCY TRANSFERRED ELECTRON DEVICES

Lester F. Eastman, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Apr. 10, 1984, Ser. No. 598,755

Int. Cl.[4] H01L *29/88, 29/20, 29/86*

U.S. Cl. 357—3 **16 Claims**



1. A high frequency transferred electron device having electron ballistic injection and extraction for very high efficiency, comprising:

a semiconductor body portion;

a first electrode;

a ballistic injection region connecting said first electrode to a first end of said body portion, said region including a potential barrier for injecting electrons into said body portion at an energy level sufficiently high to enable the electrons to traverse said body portion ballistically;

a second electrode portion;

a collector semiconductor region connecting said second electrode portion to a second end of said body portion, the connection between the second end of said body portion and said collector semiconductor region being free of any potential barrier; and

means for applying a high frequency varying potential across said electrodes to cause injection of ballistic electrons into said body portions, said applied potential varying between a low applied potential value which causes very high peak electron velocity and results in ballistic travel across said body portion and a high applied potential value which causes a transfer of injected ballistic electrons to a high mass condition for travel at a low velocity across said body portion, the potential variation producing a high efficiency ratio between the peak velocity of average electrons and the valley velocity of average electrons.

4,649,406

SEMICONDUCTOR MEMORY DEVICE HAVING STACKED CAPACITOR-TYPE MEMORY CELLS

Yoshihiro Takemae, Tokyo; Tomio Nakano, Kawasaki, and Kimiaki Sato, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation-in-part of Ser. No. 560,171, Dec. 12, 1983. This application Jun. 12, 1984, Ser. No. 619,897

Claims priority, application Japan, Dec. 20, 1982, 58-222079; Jun. 29, 1983, 57-115888

Int. Cl.[4] H02L *29/78*

U.S. Cl. 357—23.6 **12 Claims**

1. A semiconductor memory device comprising:

a semiconductor substrate of a first conductivity type;

a plurality of word lines made of a first conductive layer extending on said substrate and insulated therefrom;

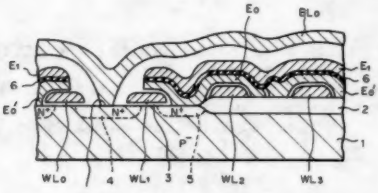
a plurality of bit lines made of a second conductive layer, said bit lines intersecting said word lines and being insulated therefrom; and

stacked capacitor-type memory cells formed in the vicinity of respective intersections between said word lines and bit

lines, to define an array of memory cells, wherein each of said memory cells comprises

first and second impurity doped regions of a second conductivity type opposite to said first conductivity type formed in said substrate, each said first impurity doped region being electrically connected to a respective one of said bit lines, said first and second impurity doped regions and a respective portion of a respective one of said word lines forming a transfer transistor,

a third conductive layer electrically connected to said second impurity doped region, for forming one of two capacitor electodes wherein, for a memory cell at the



interior of said array, said third conductive layer has a portion which overlaps, without contact, with a respective portion of the respective third conductive layer of an adjacent memory cell, so that the respective overlapping parts of the third conductive layers of the adjoining memory cells are at different levels,

an insulating layer disposed on said third conductive layer to provide the dielectric of said capacitor,

a fourth conductive layer, disposed on said insulating layer, for forming the other of said two capacitor electrodes, and

said respective bit lines extending over and being insulated from said fourth conductive layer.

4,649,407

CHARGE COUPLED DEVICE FOR TRANSFERRING ELECTRIC CHARGE

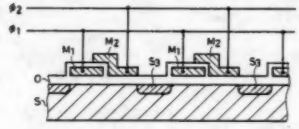
Yuji Kitamura, and Nobuhiro Mitani, both of Gifu, Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Feb. 6, 1985, Ser. No. 698,617

Claims priority, application Japan, Feb. 8, 1984, 59-22095

Int. Cl.[4] H01L *29/78;* **G11C** *19/28*

U.S. Cl. 357—24 **1 Claim**



1. A charge coupled device for transferring electric charges successively in response to first and second clock pulses, comprising:

a semiconductor substrate,

an insulating film formed on said semiconductor substrate,

a plurality of first electrodes disposed in parallel at almost equal intervals on said insulating film and each having a first and second edge,

a plurality second electrodes disposed in parallel on said insulating film and each having a first and second edge, the first edge of each of said second electrodes being in partial overlapping relationship with the first edge of one of said first electrodes and being insulated therefrom, the second edges of said first and second electrodes being free of overlap with and spaced from any other electrode, and

impurity regions of high concentration of the same conductive type as that of said semiconductor substrate, formed respectively in a surface region of said semiconductor substrate in a space between the second edges of a first electrode and said second electrode which do not overlap,

means for coupling said first clock pulse to each of said first electrodes, and

means for coupling said second clock pulse to each of said second electrodes.

4,649,408

CHARGE STORAGE TYPE SEMICONDUCTOR DEVICE AND METHOD FOR PRODUCING SAME

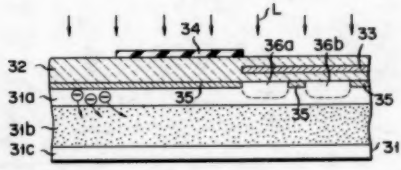
Hirokazu Sekine, Fujisawa; Katuhiko Morimune, Yokohama; Masaharu Watanabe, Yokosuka, and Nobuo Suzuki, Kamakura, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 503,645, Jun. 15, 1983, abandoned, which is a continuation of Ser. No. 171,483, Jul. 23, 1980, abandoned. This application Nov. 15, 1983, Ser. No. 551,001

Claims priority, application Japan, Jul. 23, 1979, 54-92583; May 1, 1980, 55-58398

Int. Cl.[4] H01L *29/78, 27/02, 27/14, 29/167*

U.S. Cl. 357—24 **9 Claims**



1. A charge storage type semiconductor device comprising:

a semiconductor substrate comprised of a single, crystal, said substrate having an interior short carrier diffusion length region with a crystal defect density of from $10^5/cm^2$ to $10^7/cm^2$, and at least one long carrier diffusion length region, said long carrier diffusion length region being formed in the vicinity of at least one of the major surfaces of the substrate, said long carrier diffusion length region having a thickness of from about 5 to 60 microns; and

means for accumulating charge in those portions of the substrate which are located in the vicinity of one of the major surfaces of the substrate, said interior region being separated from said charge accumulating means.

4,649,409

PHOTOELECTRIC TRANSDUCER ELEMENT

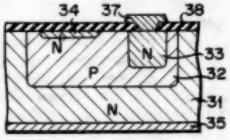
Makoto Roppongi, and Kazuaki Tsuji, both of Kitakyushu, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 19, 1983, Ser. No. 543,327

Claims priority, application Japan, Nov. 12, 1982, 57-198604

Int. Cl.[4] H01L *27/14, 31/00*

U.S. Cl. 357—30 **5 Claims**



1. A phototransistor comprising:

a semiconductor substrate of a first conductivity type constituting a collector region:

a base region of a second conductivity type formed in said semiconductor substrate and having a surface area, said base region constituting a light receiving region;

an emitter region of said first conductivity type formed in said base region and having a surface area;

a floating potential region of said first conductivity type formed in the surface layer of said base region;

a collector electrode provided on said semiconductor substrate constituting a collector region;

a base electrode provided on said base region; and

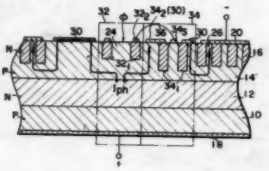
an emitter electrode provided on said emitter region.

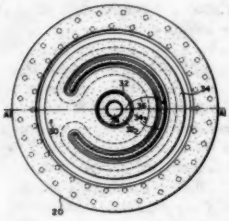
4,649,410

RADIATION CONTROLLABLE THYRISTOR WITH MULTIPLE NON-CONCENTRIC AMPLIFIED STAGES

Hiromichi Ohashi, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 391,920, Jun. 24, 1982, abandoned.
This application Jun. 14, 1985, Ser. No. 744,655
Claims priority, application Japan, Jun. 30, 1981, 56-101594
The portion of the term of this patent subsequent to Jun. 17, 2003, has been disclaimed.
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 4 Claims





1. A thyristor comprising:

a main thyristor having at least a first emitter layer, a first base layer, a second base layer and a second emitter layer, said layers being alternately layered in the order mentioned and said first emitter layer and said second base layer being one conductivity type and said first base layer and said second emitter layer being the other conductivity type;

an anode electrode provided on said first emitter layer;

a cathode layer provided on said second emitter layer;

a collecting electrode formed on a surface of said second base layer and having a surrounding portion defining a closed area in said surface of said second base layer;

a plurality of serially connected pilot thyristors each formed in said closed area and commonly using said first emitter layer, said first base layer and said second base layer, each of said pilot thristors comprising, a third emitter layer in the shape of a closed loop and having the same conductivity type as said second emitter layer, a gate electrode formed on said second base layer of said one conductivity type surrounded by said closed loop of said third emitter layer, and a cathode electrode formed on said third emitter layer of said other conductivity type;

wherein the closed loop third emitter layers of the plurality of pilot tyristors are independently formed such that no closed loop third emitter layer of any pilot thyristor is located within, or completely surrounded by, the closed loop third emitter layer of another pilot thyristor;

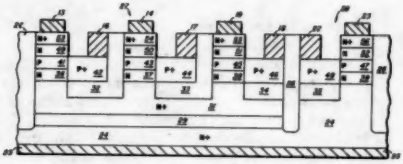
wherein a cathode electrode of a preceding stage pilot thyristor is connected to a gate electrode of a succeeding pilot thyristor through an externally provided conductor, and a third emitter layer of a final stage pilot thyristor is coupled to the second base layer of said main thyristor through said collecting electrode.

4,649,411

GALLIUM ARSENIDE BIPOLAR ECL CIRCUIT STRUCTURE

Mark S. Birrittella, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 17, 1984, Ser. No. 682,729
Int. Cl.[4] H01L *29/72*
U.S. Cl. 357—36 7 Claims



1. A monolithic semiconductor integrated circuit structure fabricated with a binary III-V compound and having a plurality of transistors, comprising:

a substrate having a first, a second and a third portion;

a first region comprising a dielectric material formed over said first portion of said substrate;

a second region having a first conductivity type formed at a surface of said first region and having a first, a second, a third and a fourth portions;

a third region comprising a dielectric material formed over said first portion of said second region;

a fourth region comprising a dielectric material formed over said second portion of said second region;

a fifth region having a second conductivity type having a first portion formed over at least part of said third region and a second portion formed over said third portion of said second region;

a sixth region having said second conductivity type having a first portion formed over at least part of said fourth region and and a second portion formed over said fourth portion of said second region;

a seventh region having said first conductivity type formed over said second portion of said fifth region; and

an eighth region having said second conductivity type formed over said second portion of said sixth region, said fifth region and said seventh region are isolated from said sixth region said eighth region.

4,649,412

READ ONLY SEMICONDUCTOR MEMORY DEVICE WITH POLYSILICON DRAIN EXTENSIONS

Taira Iwase, Kawasaki; Shoji Arizumi, Tokyo, and Fujio Masuoka, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 27, 1984, Ser. No. 674,999
Claims priority, application Japan, Nov. 29, 1983, 58-224921
Int. Cl.[4] H01L *29/78, 27/04;* G11C *11/40*
U.S. Cl. 357—41 6 Claims

1. A semiconductor memory device in which data is written

by ion implanting in a gate region of a memory cell transistor to vary the threshold voltage, comprising:

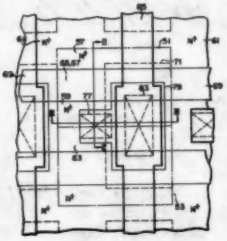
a semiconductor body;

a MOS transistor, having a gate region, source region, drain region and gate electrode formed in said semiconductor body;

a field oxide film defining an element region of said semiconductor body;

a first insulation layer formed on said MOS transistor and having a first contact hole in a prescribed position extending to the drain region of said MOS transistor;

a polycrystalline silicon layer, formed over said MOS transistor except over at least a portion of the gate region of



said MOS transistor, extending over said field oxide film, and filling the first contact hole, and directly contacting the drain region of said MOS transistor;

a second insulation layer formed covering at least said polycrystalline silicon layer and having a second contact hole in a prescribed position on said polycrystalline silicon layer, said second contact hole formed on a portion of said polycrystalline silicon layer over said field oxide film; and

a metal wire layer formed over said MOS transistor except over at least a part of said gate of said MOS transistor, and connected to said polycrystalline silicon layer via said second contact hole to transmit output signals of said MOS transistor.

4,649,413

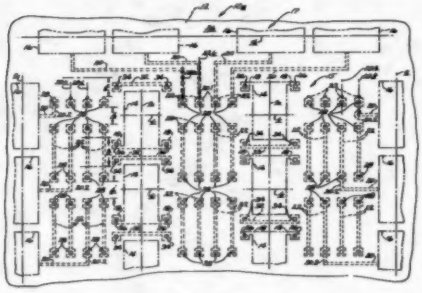
MOS INTEGRATED CIRCUIT HAVING A METAL PROGRAMMABLE MATRIX

John C. Kelly, Johnson City, Tenn., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 29, 1983, Ser. No. 527,159

Int. Cl.[4] H01L *27/02, 27/10*

U.S. Cl. 357—41 9 Claims



1. An MOS integrated circuit comprising

a substrate of semiconducting material of one conductivity type,

a plurality of MOS circuit components arranged on the substrate to form a first array, and

a plurality of second circuit components arranged on the substrate to form a second array,

characterized in that

the first MOS circuit components are arranged in plurality of columns and rows for forming the first array,

the second circuit components are arranged in a line extending along at least one side of the first array for forming the second array,

the first MOS circuit components each have first diffused regions of other conductivity type provided in the substrate for defining first conductors and have electrically insulating coating means disposed on the substrate over the first conductors, the first conductors extending from each first MOS circuit component for a selected limited distance less than the spacing of said first MOS circuit component from corresponding first MOS circuit components in adjacent columns of the first array so remote ends of the first conductors are disposed under first zones which extend across the electrically insulating coating means over the first array in parallel relation to each other and in transverse relation to said columns of first MOS circuits components in the first array, the electrically insulating coating means having first contact openings therein opening in a common plane over said remote ends of the respective first conductors for permitting electrical connection to the first conductors,

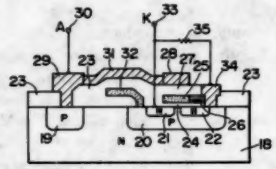
a plurality of second diffused regions of said other conductivity types are provided in the substrate under said electrically insulating coating means for defining second conductor elements arranged in respective groups corresponding to each of said second circuit components and having means electrically connecting at least one of the second conductor elements in each group to a respective second circuit component, the second conductor elements in each group being sequentially aligned and spaced to extend in parallel relation to the columns of first MOS circuit components in the first array with at least some of the groups disposed between said columns so that the second conductor elements in each pass under said respective first zones and ends ends of said second conductor elements are disposed outside said first zones which extend across the electrically insulating coating means over the first array, the electrically insulating coating means having second contact openings therein opening in said common plane over ends of each of said second conductor elements for permitting electrical connections to each end of the second conductor elements, and

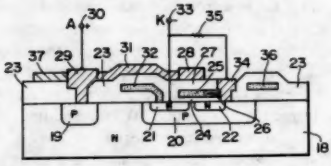
metal means are provided in a single layer in said common plane on the electrically insulating coating means and electrically connected to first conductors and second conductor elements through said first and second contact openings in the electrically insulating coating means, the conductive metal means having first portions connected to selected first conductors through first contact openings for forming first conductive paths extending lengthwise along said first zones, having second portions electrically interconnecting adjacent ends of second conductor elements within said respective groups for forming second conductive paths in matrix relation with said first conductive paths, and having third portions connecting selected first conductive paths with selected adjacent second conductive paths, thereby to provide selected interconnections of said first MOS circuit components and said second circuit components with each other.

4,649,414
PNPN SEMICONDUCTOR SWITCHES

Jun Ueda; Hirokazu Tsukada, and Yoichi Nanba, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 415,920, Sep. 8, 1982, abandoned. This application Sep. 18, 1985, Ser. No. 778,164
Claims priority, application Japan, Sep. 14, 1981, 56-143934
Int. Cl.[4] H01L 29/40
U.S. Cl. 357—53 4 Claims



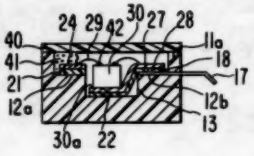


1. In a planar type PNPN semiconductor switch comprising:
an N type monocrystalline semiconductor substrate acting as an N gate region;
an anode region formed by diffusing a P type impurity into a surface of said semiconductor substrate;
a P gate region spaced from said anode region by a predetermined distance and formed by diffusing a P type impurity into the surface of said semiconductor substrate;
a combined source and cathode region formed by diffusing an N type impurity into a surface of said P gate region;
a drain region spaced from said combined source and cathode region by a predetermined distance and formed by diffusing an N type impurity into said P gate region;
a first gate electrode formed above said P gate region between said drain region and said combined source and cathode region via a first gate insulating layer;
a second gate electrode formed over said first gate electrode via a second insulating layer;
an anode electrode which is in ohmic contact with said anode region;
a resistor arranged over the surface of said substrate and having one end connected to said first gate electrode and having another end connected to both said P gate region and said drain region; and
a conductive layer disposed on an insulating layer for electrically interconnecting said anode electrode and said second gate electrode;
the improvement which comprises a polycrystalline silicon field plate electrode extending under said conductive layer and over a PN junction between said P gate region and said N type substrate; one end of said field plate electrode being in contact with said combined source and cathode region and another end of said field plate electrode extending over the surface of said substrate between said anode region and said P gate region; said field plate electrode being isolated from said conductive layer and the surface of said substrate by insulating layers, whereby the extension of a depletion layer from said anode region to said P gate region is prevented.

4,649,415
SEMICONDUCTOR PACKAGE WITH TAPE MOUNTED DIE

David F. Hebert, Hayward, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jan. 15, 1985, Ser. No. 691,996
Int. Cl.[4] H01L 23/02, 23/12
U.S. Cl. 357—74 15 Claims

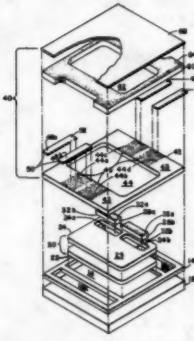


1. A semiconductor package comprising:
a housing having a depressed interior trough bounded by a flat ledge;
a flexible tape having electrically conductive bond pads at edges thereof;
a conductive lead frame having contact fingers resting on said flat ledge and extending outwardly from said housing;
said tape bond pads extending over said lead frame contact fingers above said ledge;
means for attaching a semiconductor die having contact bond pads to said tape in said depressed interior trough, said means including a die attach tab integral with said tape and extending in a plane below said tape bond pads;
means for bonding said tape bond pads to said contact fingers and for bonding selected ones of said die bond pads to said tape bond pads; and
means for protectively covering said ledge, said tape and said die.

4,649,416
MICROWAVE TRANSISTOR PACKAGE

Michael T. Borkowski, Framingham; David G. Laighton, Boxboro, and Barry Altschul, Framingham, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 3, 1984, Ser. No. 567,829
Int. Cl.[4] H01L 23/02; H02G 13/08
U.S. Cl. 357—74 5 Claims



4. A microwave transistor package comprising:
(a) a thermal and electrical conductive substrate;
(b) a ground plane plate having an open-ended compartment therein, such open-end being disposed adjacent an upper surface portion of the ground plane plate, a bottom surface of such plate being disposed on an upper, inner surface

region of the substrate, the thermal coefficient of expansion of the ground plane plate being substantially greater than the thermal coefficient of expansion of the substrate;

(c) electrical insulator means for supporting a microwave transistor, said electrical insulator means being disposed within the compartment, having a relatively high thermal transfer characteristic and having upper and lower conductive layers with side wall portions disposed adjacent side wall portions of the compartment;

(d) a first apertured ceramic insulating layer having conductive metallization regions disposed on the upper surface of the ceramic insulating layer and extending from adjacent the apertured edge of the ceramic insulator to adjacent the outer edge of the ceramic insulator, the lower surface of the ceramic insulator being disposed over a surface portion of the substrate disposed about peripheral portions of the inner surface region of the substrate; and

(e) a second apertured ceramic insulating layer disposed over and aligned with the first apertured ceramic insulating layer, the upper surface of the second ceramic insulating layer being metallized and bondable to a cover for such package.

4,649,417

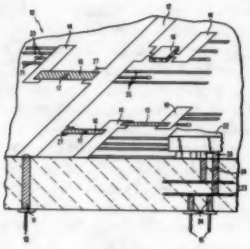
MULTIPLE VOLTAGE INTEGRATED CIRCUIT PACKAGING SUBSTRATE

Allan C. Burgess, Yorktown Heights; Robert O. Lussow, Hopewell Junction, and George E. Melvin, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 22, 1983, Ser. No. 534,900

Int. Cl.⁴ H01L *39/02*

U.S. Cl. 357—80 **13 Claims**



1. In a multilayer dielectric material integrated circuit packaging substrate having internal wiring for interconnecting integrated circuit devices mounted at predetermined locations on the top surface thereof, the improvement comprising:

voltage supply means incorporated with said multilayer dielectric material substrate, extending to said top surface of said substrate, providing a first integrated circuit operating voltage at said top surface; and

voltage converting means on said top surface, the input of which is electrically connected to said voltage supply means, for providing a plurality of distinct integrated circuit operating voltages at appropriate integrated circuit interconnecting positions at said predetermined locations.

4,649,418

DATA CARD AND METHOD OF MANUFACTURING SAME

Edward Uden, Barmstedt, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 22, 1983, Ser. No. 534,999

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1982, 3235650

Int. Cl.⁴ G06K *19/00*; H01L *39/02*

U.S. Cl. 357—80 **10 Claims**

1. A data card comprising a lower covering film, an upper covering film and a card body positioned between said covering films, in which card body at least one semiconductor element is present and is connected to a carrier body which carrier body is provided on one or both surfaces thereof conductor tracks, characterized in that:

(a) the carrier body (4) is a film which carries electric conductor tracks (11, 12) at one or both surfaces thereof and which carrier body is provided with at least one perforation (10) extending from the upper to the lower surface of said carrier body, in which perforation there is arranged a semiconductor element consituted by a semiconductor chip (5);

(b) at least one surface of the semiconductor chip (5) is connected through wire connections (7) to the conductor tracks (11) on a surface of the carrier body (4);

(c) the carrier body (4) carries on the surface thereof connected to the wire connections (7) a frame (8) having an upper side opening which surrounds the semiconductor chip and the wire connections and has a height such that the distance of the lower surface of the carrier body (4) to the upper side opening of the frame (8) is substantially equal to the thickness of the card body (3) and p1 (d) the space inside the frame (8) is filled up to its upper side opening with a covering mass (9) enclosing the semiconductor chip (5) and the wire connections (7).

4,649,419

PSEUDO-RANDOM BINARY SEQUENCY GENERATOR

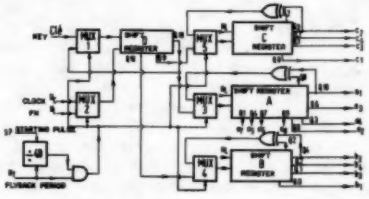
Jean-Pierre Arragon, Roissy; Christian Cantou, Combs-la-Ville, and Gérard J. M. Marie, Santeny-Villecresnes, all of France, assignors to La Radiotechnique, Suresnes (Hauts de Seine), France

Continuation of Ser. No. 562,384, Dec. 16, 1983, abandoned. This application Dec. 17, 1985, Ser. No. 810,529

Claims priority, application France, Dec. 20, 1982, 82 21361; Aug. 22, 1983, 83 13540

Int. Cl.⁴ H04N *7/167*

U.S. Cl. 380—20 **25 Claims**



1. A psuedo-random binary address generator for supplying addresses of cutting points of a composite video signal encoded by rotation of two segments situated on either side of each

cutting point, comprising three feedback shift registers for generating polynomials which are irreducible and primitive, whereby bit sequences a, b, c which they deliver are of a maximum length, said registers having different numbers of cells n_a, n_b, n_c, said registers having outputs a_i, b_j and c_k, said addresses of the cutting points comprising the sum of N coefficients S expressed as

$$\text{sum} = \sum_{h=0}^{h=N-1} S_H 2^h$$

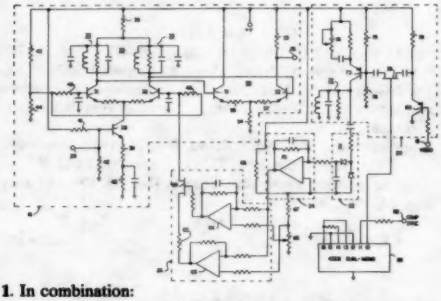
where N is greater than 3, at least the four of said coefficients having the greatest weight, S_N-1, S_N-2, S_N-3 and S_N-4 being derived by logic equations which consist of modulo 2 addition of said three outputs a_i, b_j and c_k, denoted $(a_i \oplus b_j \oplus c_k)$, and the ranks i, j and k being selected to be different by the degree n_a, n_b and n_c of the registers.

4,649,420

AUTOMATIC FREQUENCY RESPONSE CORRECTION USING COLOR BURST

Gordon E. Kelly, Algonquin; Gopalan Krishnamurthy, Hillside, and Jouke N. Rypkema, Lombard, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Jun. 12, 1985, Ser. No. 744,166
Int. Cl.[4] H04N 9/68
U.S. Cl. 358—38 **6 Claims**



1. In combination:

means for receiving a color television signal including color and picture components, said means for receiving comprising a differential amplifier having a pair of tuned circuits, each tuned to a frequency near opposite ends of the IF band;

means for detecting the difference between the level of the color burst in said color television signal and a reference signal, said reference signal comprising a voltage related to the nominal peak color burst level in said color television signal; and

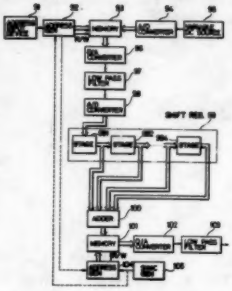
means responsive to said detected difference for adjusting the relative levels of said color and picture components of said color television signal.

4,649,421

CIRCUIT FOR GENERATING A SIGNAL FOR CORRECTING REGISTRATION IN A COLOR TELEVISION CAMERA WITH REDUCTION IN GENERATION OF SHADING

Takuma Kodama, Kokubunji; Kenji Takahashi, Shiroyama; Shizuka Ishibashi, Musashimurayama; Koji Kudo, Hachioujl; Yukihiro Masuda, Kodaira; Masanori Hombough, Mitaka; Osamu Miyoshi, and Kazuhisa Yoshiwara, both of Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo; Hitachi Denshi Kabushiki Kaisha, Kanagawa and Hitachi Video Engineering Inc., all of, Japan

Filed Oct. 29, 1984, Ser. No. 666,035
Claims priority, application Japan, Nov. 2, 1983, 58-204844
Int. Cl.[4] H04N 9/093, 3/23/5/228; H01J 29/56
U.S. Cl. 358—51 **18 Claims**



1. A circuit for generating a signal for correcting registration in a color television camera, comprising:

first memory means having a plurality of horizontally- and vertically-arrayed storage locations for digitally storing a plurality of correction quantities corresponding to predetermined positions on a target scanned by an electron beam in an image pickup tube;

digital-to-analog converter means for converting correction quantities read out from said first memory means into analog quantities to produce an analog signal;

smoothing circuit means for smoothing the analog signal produced by said digital-to-analog converter means;

analog-to-digital converter means for converting an output signal from said smoothing circuit means into a digital signal by sampling said output signal at a sampling frequency higher than a frequency at which correction quantities stored in vertically-arrayed storage locations of said first memory means are read out;

adder means for adding together a group of sequential samples produced by said analog-to-digital converter means, each sequential sample of said group replaced by an immediately succeeding sequential sample each time said sequential samples are added together;

second memory means for storing an output signal from said adder means;

means for reading out said signal stored in said second memory means in synchronism with electron beam scanning of the target of said image pickup tube; and

digital-to-analog converter means for converting said signal read out from said second memory means into an analog signal.

4,649,422

METHOD OF AND ARRANGEMENT FOR DETERMINING THE SHARPNESS OF ORIGINALS FOR REPRODUCTION

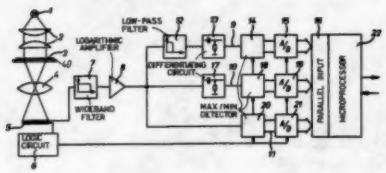
Wilfried Rauskolb; Helmut Treiber, and Wilhelm Nitsch, all of Munich, Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 28, 1985, Ser. No. 706,499

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1984, 3408765

Int. Cl.[4] G03F *3/08*

U.S. Cl. 358—76 26 Claims



1. A method of determining the sharpness of an original comprising the steps of:

(a) scanning a series of linear regions of said original;

(b) generating a scanning signal for each of said regions which is representative of the density of the respective region;

(c) processing each of said scanning signals to yield a sharp signal and a fuzzy signal;

(d) deriving a maximum density gradient from each of said sharp signals and each of said fuzzy signals;

(e) establishing a series of first values from said maximum density gradients, the establishing step including calculating the ratio between the maximum density gradient of each sharp signal and the maximum density gradient of the corresponding fuzzy signal; and

(f) classifying said original as to its degree of sharpness by comparing said first values with respective reference values which are a function of the density gradients of said sharp signals.

4,649,423

METHOD AND CIRCUIT ARRANGEMENT FOR SELECTIVE CORRECTION OF HUES AND COLORS

Ingo Hoffrichter, Kiel; Eggert Jung, Schoenberg, and Hans Keller, Kiel, all of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Dec. 12, 1984, Ser. No. 680,775

Claims priority, application European Pat. Off., Dec. 14, 1983, 83112579

The portion of the term of this patent subsequent to Dec. 23, 2003, has been disclaimed.

Int. Cl.[4] H04N *1/46*

U.S. Cl. 358—80 17 Claims

1. A method for selective correction of hues and colors of a color original in the production of a color separation, comprising the steps of:

(a) defining within a color space a hue T_σ to be selectively corrected or a color to be selectively corrected;

(b) opto-electronically scanning the original point-by-point and line-by-line for generating measured color value signals R, G, B;

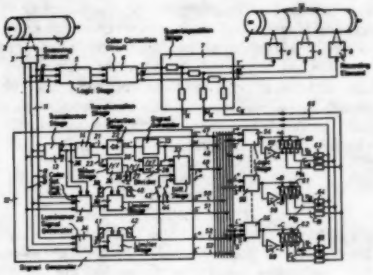
(c) converting the measured color value signals R, G, B into corrected color signals Y, M, C, in a first correction operation;

(d) transforming the measured color value signals R, G, B into chrominance signals x, y corresponding to a transformation of an RGB color space of the signals R, G, B into a chrominance/luminance color space, and deriving a hue signal T' from the chrominance signals x, y and which provides information about a value-wise deviation of the hues of the scanned colors from the hue T_σ;

(e) deriving a color saturation signal S' from the measured color value signals R, G, B identifying color saturation of the scanned colors;

(f) deriving a luminance signal L' from the measured color value signals R, G, B identifying luminance of the scanned colors;

(g) limiting the hue signal T' with an auxiliary control signal H and forming a respective limited hue signal T*, limiting the color saturation signal S' to a desired range to form a limited color saturation signal S*, and limiting the luminance signal L' to a desired range to form a limited luminance signal L*;



(h) for correction hues based on the hue T_σ to be selectively corrected, employing the limited hue signal T*, or for correcting colors based on the color to be selectively corrected, employing the signals T*, S*, and L*;

(i) generating selective correction signals Y_K, M_K, C_K derived from at least one of the limited signals T*, S*, L* and non-limited signals T', S', L' for a color correction or at least one of the signals T* and T' for a hue correction; and

(j) superimposing the selective correction signals Y_K, M_K, C_K on the corrected color signals Y, M, C in a second correction operation to create color separation signals Y', M', and C' for use in producing the color separation.

4,649,424

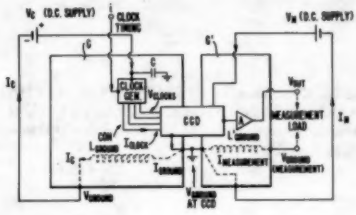
GROUNDING SYSTEM FOR CCD IMAGING APPARATUS AND THE LIKE

Robert Bishop, Brookline, Mass., assignor to Beltronics Inc., Brookline, Mass.

Filed Jun. 11, 1985, Ser. No. 743,504

Int. Cl.[4] H01L *23/14*

U.S. Cl. 357—84 3 Claims



1. In CCD imaging apparatus and the like embodying CCD chip means, clock generating chip circuitry and power supply means for providing clocking signals for the CCD chip means, and measurement output circuitry with cooperative power supply means for outputing signals corresponding to the im-

ages sensed and processed by the CCD chip means, apparatus for obtaining single element or pixel resolution with high signal-to-noise ratio independently of clocking signal-induced ringing of inherent inductance in the grounding system of the CCD chip means, said apparatus comprising, in combination, a pair of separate but adjacent ground plane surfaces having mounted thereon the CCD chip means, the clocking generating chip circuitry and the measurement output circuitry; one of the separate ground plane surfaces having mounted thereon the clock generating chip circuitry and being connected to receive power supply d.c. current flowing therethrough for the clock generation; the other adjacent ground plane surface having mounted thereon the measurement output circuitry and being connected to receive power supply d.c. current flowing therethrough for measurement; means for connecting the adjacent ground planes at a limited region; and large capacitance means connected directly at the chip(s) of the clock generating chip circuitry and to ground; and a low inductance connection between said clock generating chip circuitry and the CCD chip means for insuring substantially instantaneous current for switching in response to the clocking signals without clock pulse lead inductance distortion.

4,649,425

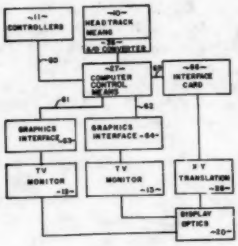
STEREOSCOPIC DISPLAY

Marvin L. Pund, 2930 Arlmont Dr., Bel Nor, Mo. 63121

Continuation of Ser. No. 516,710, Jul. 25, 1983, abandoned. This application Jan. 16, 1986, Ser. No. 819,919

Int. Cl.[4] H04N *13/04*

U.S. Cl. 358—88 **23 Claims**



23. A method of providing a three dimensional view to an observer comprising the steps of:

generating a first image for projection toward a first eye of the observer;

generating a second image for projection toward a second eye of an observer;

monitoring the position of the observer; and

changing the projected image perspective as a function of observer position.

4,649,426

ELECTRONIC IMAGING SYSTEM AND TECHNIQUE

Jon O. Bolstad, Idaho Falls, Id., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 12, 1984, Ser. No. 619,759

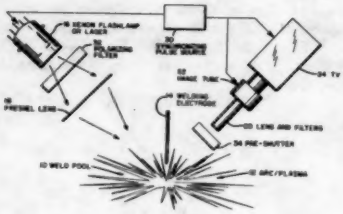
Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—101 **23 Claims**

1. A system for viewing a weld site obscured by an intense plasma or flame comprising:

a pulsed light source providing an illumination beam for illuminating the weld site, the peak brightness of the light reflected from the weld site being greater than the brightness of the intense plasma or flame;

an electronic image sensor for detecting a pulsed image of the illuminated weld site, said sensor operating as a high-speed shutter; and



electronic means for synchronizing said shutter operation with said pulsed light source.

4,649,427

VIDEO SIGNAL DELAY CIRCUIT

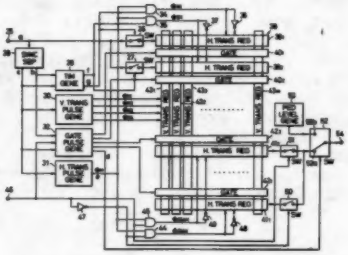
Takuya Tsushima, Ayase, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 5, 1985, Ser. No. 708,218

Claims priority, application Japan, Mar. 6, 1984, 59-43644

Int. Cl.[4] H04N *5/14, 5/213, 3/14*

U.S. Cl. 358—160 **9 Claims**



1. A video signal delay circuit comprising:

a plurality of input horizontal transfer registers which are arranged in rows and serially supplied with an input composite video signal, each of said plurality of input horizontal transfer registers transferring horizontally sampled signals every time an input horizontal transfer clock pulse is applied thereto, said sampled signals being obtained by sampling the input composite video signal by the input horizontal transfer clock pulse;

switching means for selectively supplying the input composite video signal to one of said plurality of input horizontal transfer registers;

a plurality of input vertical transfer gates provided on parallel output sides of the respective plurality of input horizontal transfer registers, each of said input vertical transfer gates being supplied in parallel with the sampled signals from a corresponding input horizontal transfer register among the plurality of input horizontal transfer registers and passing the sampled signals during a time period in which said corresponding input horizontal transfer register does not perform a horizontal transfer;

a plurality of vertical transfer registers which are arranged in columns to cross said plurality of input horizontal transfer registers, said plurality of vertical transfer registers being supplied with the sampled signals from one of said plurality of input vertical transfer gates, each of said verti-

cal transfer registers having a constant number of stages and successively transferring vertically a sampled signal supplied thereto every time a vertical transfer clock pulse is applied thereto;

at least one output vertical transfer gate for gating parallel output signals of said plurality of vertical transfer registers;

at least one output horizontal transfer register which is arranged in a row, each of said at least one output horizontal transfer register temporarily storing parallel output signals of a corresponding output vertical transfer gate among said at least one output vertical transfer gate and transferring horizontally the stored signals every time an output horizontal transfer clock pulse is applied thereto so as to serially produce a delayed composite video signal;

a horizontal transfer clock pulse generating circuit for generating the input and output horizontal transfer clock pulses based on a horizontal synchronizing signal within the input composite video signal;

a vertical transfer clock pulse generating circuit for generating the vertical transfer clock pulse at a rate of once per one horizontal scanning period of the input composite video signal based on the horizontal and vertical synchronizing signals within the input composite video signal and for supplying the vertical transfer clock pulse to said plurality of vertical transfer registers;

horizontal transfer register selecting means for selectively supplying the output horizontal transfer clock pulse of said horizontal transfer clock pulse generating circuit to an arbitrarily selected one of said plurality of input horizontal transfer registers and to an arbitrarily selected one of said at least one output horizontal transfer register based on at least the horizontal and vertical synchronizing signals within the input composite video signal, said horizontal transfer register selecting means selectively obtaining said delayed composite video signal from only said arbitrarily selected one of said at least one output horizontal transfer register;

control means for controlling said switching means to selectively supply the input composite video signal to said arbitrarily selected one of said plurality of input horizontal transfer registers; and

a vertical transfer gate pulse generating circuit for generating a vertical transfer gate pulse in phase synchronism with said vertical transfer clock pulse based on the horizontal and vertical synchronizing signals within the input composite video signal, said vertical transfer gate pulse generating circuit supplying the vertical transfer gate pulse to one of said plurality of input vertical transfer gates coupled to the parallel output side of said arbitrarily selected one of said plurality of input horizontal transfer registers and to one of said at least one output vertical transfer gate coupled to a parallel input side of said arbitrarily selected one of said at least one output horizontal transfer register so as to open said one input vertical transfer gate and said one output vertical transfer gate.

4,649,428

DIGITAL TV WITH LOW COST AUXILIARY DEVICE COMMUNICATION SYSTEM

Gary A. Jones, Arlington Heights, Ill.; Raymond M. Rees, Salem, Wis., and Thomas J. Zato, Palatine, Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Jun. 18, 1985, Ser. No. 746,202

Int. Cl.[4] H04N 5/00

U.S. Cl. 358—188 **8 Claims**

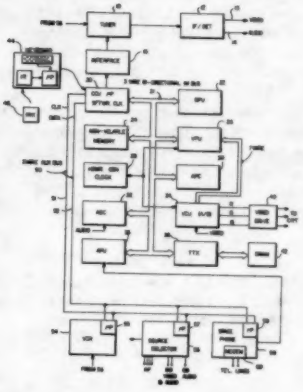
1. A digital television system comprising:

a high speed microprocessor controller including means for producing a high speed hardware generated clock signal and means for producing a low speed software generated clock signal;

a plurality of television function modules for performing a plurality of television signal processing functions;

a plurality of auxiliary devices for performing functions ancillary to said television signal processing, each of said auxiliary devices including a standard off-the-shelf microprocessor including means for responding to software generated clock signals;

a high speed communication bus linking said microprocessor controller and the high speed hardware generated clock signal with said plurality of television function modules for enabling control of the operation of said modules;



a low speed communication link interconnecting said microprocessor controller and the low speed software generated clock signal with each of said microprocessors in said auxiliary devices; and

the microprocessor in each of said auxiliary devices being in a slave relationship to said microprocessor controller and performing as data communication devices.

4,649,429

CIRCUIT FOR DISPLAYING SELECTION OF A CHANNEL IN A TELEVISION SET

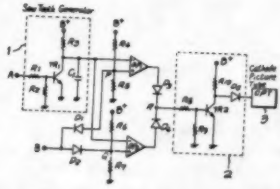
Chan W. Park, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 12, 1984, Ser. No. 680,903

Claims priority, application Rep. of Korea, Dec. 13, 1983, 10593-83[U]

Int. Cl.[4] H04N 5/50

U.S. Cl. 358—192.1 **1 Claim**



1. A bar type fine tuning indicating system for a television receiver comprising:

means for generating a saw tooth wave in a predetermined period by a horizontal blanking pulse signal applied to an input terminal coupled to a negative input terminal of a first operational amplifier and to a positive input terminal of a second operational amplifier;

a first connection point between first and second resistors, respectively, for reference voltage setting purpose coupled to said positive input terminal of said first operational amplifier; and

a second connection point between third and fourth resistors, respectively, for reference voltage setting purpose coupled to said negative input terminal of said second operational amplifier,

said first and second connection points set so as to have voltage values, respectively, slightly less than and greater than output voltage of an AFT circuit being coupled via first and second diodes, respectively, to an output terminal of said AFT circuit so that said voltages of said first and second connection points are varied in accordance with variance of output voltage of said AFT circuit and each of said first and second operational amplifiers having an output terminal connected through third and fourth diodes, respectively, to a CPT driving circuit coupled to a CPT,

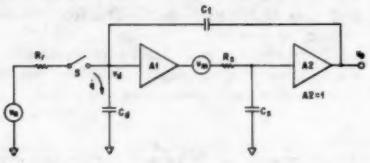
whereby a color bar is produced in the middle of a television screen when said television receiver is fine tuned and the width of said bar becomes broader in either the right or left direction from the middle of said screen according to the variance of said output voltage of said AFT circuit when said television receiver is detuned.

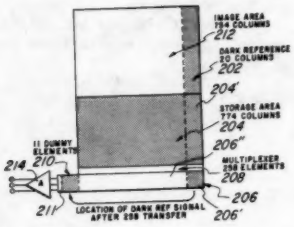
4,649,430

CCD IMAGER WITH MANY DUMMY PIXELS

Jaroslav Hynecek, Richardson, Tex., assignor to Texas Instruments, Incorporated, Dallas, Tex.

Filed Aug. 27, 1985, Ser. No. 770,325
Int. Cl.[4] H04N *5/18, 3/14*
U.S. Cl. 358—213 **8 Claims**





1. An imager comprising:

an image area comprising a plurality of columns of CCD elements, said image area also comprising a dark reference area comprising a further plurality of columns of CCD elements shielded from-exposure to light:

a storage area, comprising a plurality of columns of CCD elements shielded from exposure to light, and further comprising:

a CCD serial shift register, comprising means for receiving packets of charge from respective ones of said columns of CCD elements in said storage area, and a coadjacent chain of dummy elements adjacent to said amplifier, each dummy element in said coadjacent chain of dummy elements being a CCD element which is not connected to receive charge packets from any column of said storage area except by transfer through respective other elements in said shift register;

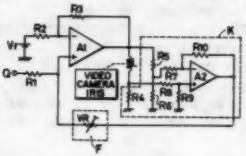
and an amplifier connected to said serial register at the opposite end from the portion of said serial register which initially receives charge packets generated in said dark reference area from said storage area.

4,649,431

VIDEO CAMERA IRIS CONTROL CIRCUIT

Hiroto Terashi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1983, Ser. No. 516,491
Claims priority, application Japan, Jul. 24, 1982, 57-128327
Int. Cl.[4] H04N *5/235*
U.S. Cl. 358—228 **9 Claims**



1. An iris control circuit for a video camera, comprising;

drive coil means including a drive coil for driving the iris of a video camera;

means for inputting an iris control signal to said drive coil means;

detecting circuit means for detecting a counterelectromotive force produced in said drive coil;

feedback circuit means for generating a feedback signal in response to an output of said detecting circuit means, said feedback signal being applied to said drive coil means;

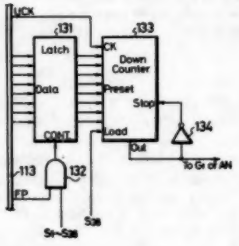
said drive coil means further comprising means for controlling the flow of current through said drive coil in response to at least one of said iris control signal and said feedback signal.

4,649,432

VIDEO DISPLAY SYSTEM

Yuji Watanabe, and Yasuyuki Endoh, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 25, 1985, Ser. No. 694,956
Claims priority, application Japan, Jan. 27, 1984, 59-13878
Int. Cl.[4] H04N *3/15, 5/70*
U.S. Cl. 358—241 **5 Claims**



1. A video display system comprising:

a display device including a plurality of display cells arranged in an X-Y matrix form;

a video signal source for supplying a digital video signal;

a pulse width modulator connected to said video signal source for deriving a PWM signal corresponding to a brightness level of said digital video signal, said pulse

width modulator including a counter supplied with said digital video signal as a datum signal and a clock signal generator for supplying a clock signal to said counter; and

signal supplying means connected to said pulse width modulator for supplying said PWM signal to said display device and reproducing a picture thereon,

characterized by

control means connected to said clock signal generator for changing the frequency of the clock signal supplied to the counter and controlling the brightness of the picture reproduced on said display device.

4,649,433

ARRANGEMENT FOR MAKING A PHOTOGRAPHIC SLIDE OR CINE-FILM RECORDING OF A TELEVISION PICTURE

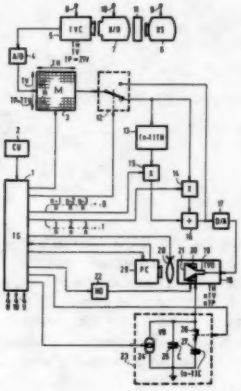
Leonardus A. J. Verhoeven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 4, 1984, Ser. No. 607,071

Claims priority, application Netherlands, May 4, 1983, 8301566

Int. Cl.⁴ H04N *5/84*

U.S. Cl. 358—244 **5 Claims**



1. In an arrangement for making a photographic recording of a television picture corresponding to a picture signal having raster line and picture periods, such arrangement comprising a television display device having a picture display screen and producing thereon a line raster in accordance with the picture signal, and a photographic camera directed towards the display screen for photographing the television picture thereon; the improvement consisting of a line structure correction circuit for reducing the visibility of the raster line structure of the television picture, such line structure correction circuit comprising:

means for storing the picture information in successive raster line periods of the picture signal;

signal processing circuit means for supplying to said television display device, in at least "n" consecutive raster line periods of the television picture displayed thereon, the stored picture signal information associated with each raster line of the picture signal; the raster line periods of the displayed television picture being the same as the raster line periods of the picture signal; and

a vertical deflection circuit coupled to the television display device for producing the picture period of the television picture displayed thereon, such picture period being equal to "n"-times the picture period of said picture signal, the number "n" being an integer at least equal to two;

whereby the picture information in each raster line of the picture signal is repeated in at least "n" successive raster lines of the picture on the display screen of the television display device.

4,649,434

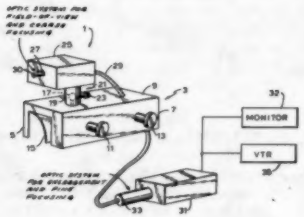
EYEGLASS-FRAME MOUNTABLE VIEW MONITORING DEVICE

Lee S. Weinblatt, 797 Winthrop Rd., Teaneck, N.J. 07666

Filed Jan. 23, 1984, Ser. No. 572,818

Int. Cl.⁴ H04N *5/225*

U.S. Cl. 358—250 **15 Claims**



1. Apparatus for monitoring the view being looked at by a person wearing eyeglasses, and including a viewing optic system for mounting to said eyeglasses to provide an image to an imaging system remote from said eyeglasses, said eyeglasses including a frame and a temple piece, the viewing optic system comprising;

a support;

quick-release means for releasably yet firmly securing said support to the temple piece of substantially any type of ordinary eyeglasses;

optic system means carried on said support for viewing an image and being associated with said remote imaging system; and

aiming means for selectively adjusting the optic system means relative to the eyeglasses to thereby modify the direction in which the optic system is aimed.

4,649,435

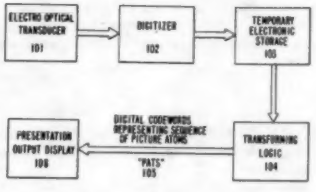
METHOD AND APPARATUS FOR CODING PICTORIAL INFORMATION FOR EFFICIENT STORAGE, TRANSMISSION AND REPRODUCTION

Henry P. Kramer, 1503 Mission Canyon, Santa Barbara, Calif. 93105

Continuation of Ser. No. 183,372, Sep. 2, 1980, abandoned. This application Mar. 3, 1983, Ser. No. 471,620

Int. Cl.⁴ H04N *7/12*

U.S. Cl. 358—260 **6 Claims**



GENERAL LAYOUT OF THE INVENTION

1. In a system for the transmission of images:

means for encoding an image by generating a set of data representing said image, said means for encoding comprising

means for dividing the image into selected subpictures;

means for representing each subpicture with a character selected from a font of characters, each character in the

font having an outline which is either square or rectangular, and the particular character being selected to match each subpicture such that the pattern in that character most closely matches said subpicture;

means for replacing adjacent identical selected characters with larger characters from said font of characters, each larger character in the font having an outline which is either square or rectangular; and

means for generating said set of data, said set of data representing the characters selected from said font of characters; and

means for reproducing a facsimile of said image from said set of data, wherein no apparatus for decoding is required at the receiver other than to identify the proper characters in said font of characters to be used for reproducing the image from said set of data.

4,649,436

IMAGE PROCESSING APPARATUS IN FILM IMAGE PHOTOTELEGRAPHY

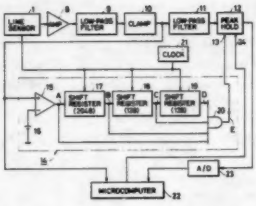
Yukio Nakagawa, and Ryuzo Motoori, both of Kawasaki, Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Jan. 23, 1985, Ser. No. 694,144

Claims priority, application Japan, Jan. 26, 1984, 59-12649

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—280 **5 Claims**



1. an apparatus having a frame for holding an optically recorded medium and a line sensor including a plurality of photoelectric conversion elements aligned in one direction, said line sensor being moved in another direction substantially perpendicular to said one direction so as to scan said medium held by said frame and generate a plurality of image signals continuously, corresponding to respective scanning lines, said apparatus comprising:

(a) comparing means for comparing a level of each of said image signals with a reference level and producing a comparing signal;

(b) detecting means for detecting a minimum level of each of said image signals; and

(c) control means for controlling the period of time during which said detecting means detects the minimum level of each of said image signals in accordance with said comparing signal.

4,649,437

PICTURE IMAGE FORMING APPARATUS

Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Nov. 13, 1985, Ser. No. 797,468

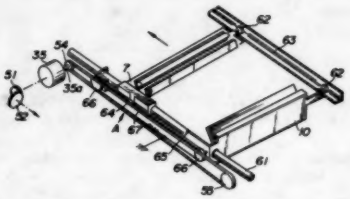
Claims priority, application Japan, Nov. 14, 1984, 59-240211

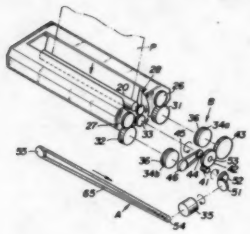
Int. Cl.[4] H04N *1/04*

U.S. Cl. 358—286 **11 Claims**

1. Picture image forming apparatus comprising:

scanning means for scanning a manuscript to read picture information and including a first carriage for carrying a first mirror for reflecting light reflected from said manuscript in a direction substantially parallel with said manuscript, said first carriage moving said first mirror at a first speed with respect to said manuscript, a second carriage for carrying second and third mirrors for reflecting light reflected by said first mirror in a direction substantially parallel with said reflected light, said second carriage moving said second and third mirrors with respect to said manuscript at a second speed one half of said first speed, and optical reading means for reading out a picture image of said manuscript from light reflected by said third mirror;





printing means for printing a picture image on a printing paper based on said picture information;

a single source of power for moving said scanning means and for conveying said printing paper;

first power transmitting means for transmitting the driving power of said source of power to said scanning means; and

second power transmitting means for transmitting the driving power of said source of power to said printing means.

4,649,438

PHASE LOCKED SIGNAL GENERATOR

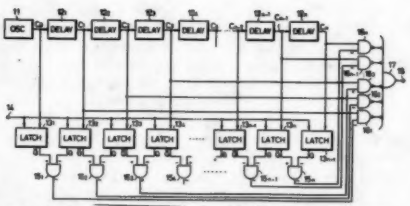
Kyoichi Shimizu, and Akira Fujita, both of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Nov. 5, 1984, Ser. No. 668,034

Claims priority, application Japan, Nov. 4, 1983, 58-207110

Int. Cl.[4] H04N *5/78*; H03L *7/00*

U.S. Cl. 358—337 **10 Claims**



1. A phase locked signal generator for producing a square wave signal which is phase locked to a reference signal, said phase locked signal generator comprising:

an asynchronous oscillator for producing a square wave signal;

delay means supplied with the square wave signal from said asynchronous oscillator, said delay means comprising first through nth delay circuits which are coupled in series, where n is an integer, said asynchronous oscillator supplying the square wave signal to said first delay circuit;

latch means responsive to said reference signal for simultaneously latching the square wave signal from said asynchronous oscillator and the output of said first through nth delay circuits, said latch means comprising first through (n+1)th latch circuits which are supplied with said reference signal and first through nth AND circuits which are supplied with outputs of said first through (n+1)th latch circuits, said first latch circuit latching the square wave signal from said asynchronous oscillator in response to said reference signal, an ith latch circuit latching an output of a (i−1)th delay circuit in response to said reference signal, a (i−1)th AND circuit being supplied with a $\overline{Q}$-output of a (i−1)th latch circuit and a Q-output of said ith latch circuit, where i is an arbitrary integer from 2 to n+1; and

gate means supplied with the outputs of said first through nth delay circuits and outputs of the first through nth AND circuits, said gate means comprising first through nth NAND circuits and an OR circuit which is supplied with outputs of the first through nth NAND circuits, and a jth NAND circuit being supplied with outputs of a jth delay circuit and a jth AND circuit, where j is an arbitrary integer from 1 to n, said gate means passing an output of one of said first through nth delay circuits as an output square wave signal of the phase locked signal generator, said one of said first and nth delay circuits having an input and an output of mutually opposite polarities at a time when said reference signal is applied to the latch means.

4,649,439

SYSTEM FOR REPRODUCING A VIDEO SIGNAL IN A STILL PICTURE REPRODUCTION

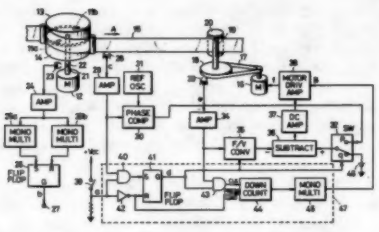
Hidenori Tanaka, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed May 23, 1984, Ser. No. 613,510

Claims priority, application Japan, May 27, 1983, 58-79918[U]

Int. Cl.⁴ H04N 5/783

U.S. Cl. 360—10.3 **6 Claims**



1. A system for reproducing a video signal in a still picture reproduction in a video signal reproducing apparatus, said reproducing apparatus comprising a capstan for driving and moving a magnetic tape which has a video signal pre-recorded on tracks formed obliquely to a longitudinal direction of said magnetic tape and has a control signal having a constant frequency pre-recorded on a control track formed in the longitudinal direction of said magnetic tape, a capstan motor for rotating said capstan, rotation detection pulse signal generating means for generating a rotation detection pulse signal responsive to a detection of a rotation of said capstan or said capstan motor, a plurality of rotary video heads for scanning over the oblique tracks on said magnetic tape so as to reproduce the pre-recorded video signal, and a control head for scanning over the control track on said magnetic tape so as to reproduce the control signal, said system comprising:

still picture reproduction mode signal generating means for generating a still picture reproduction mode signal during a still picture reproduction mode of said reproducing apparatus;

rotation stopping signal generating means for counting a predetermined number of pulses in the rotation detection pulse signal received from said rotation detection pulse signal generating means, after said still picture reproduction mode signal is generated from said still picture reproduction mode signal generating means, from a point in time when a reproduced control pulse signal from said control head or a signal in phase with the reproduced control pulse signal is first applied to said rotation stopping signal generating means as a reference signal, and for generating a rotation stopping signal as an output signal when said predetermined number of pulses are counted;

reducing means responsive to the still picture reproduction mode signal generated from said still picture reproduction mode signal generating means, for reducing a voltage which is applied to said capstan motor; and

stopping means for stopping the rotation of said capstan motor responsive to said rotation stopping signal which is applied to said stopping means after said voltage applied to said capstan motor has been reduced and a rotational speed of said capstan motor has decreased,

said predeterined number being selected to a value so that said magnetic tape stops moving at a position where a noise in a reproduced picture which is obtained from the video signal reproduced by said rotary video heads is a minimum.

4,649,440

MAGNETIC-TAPE-CASSETTE APPARATUS WITH IMPULSE RESET TO THE REST POSITION

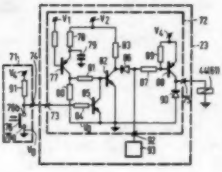
Ludo H. J. Mordant, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 27, 1985, Ser. No. 770,030

Claims priority, application Netherlands, Aug. 30, 1984, 8402637

Int. Cl.⁴ G11B 15/10, 15/18

U.S. Cl. 360—69 **12 Claims**



1. A magnetic-tape-cassette apparatus, comprising a servo device for positioning at least one apparatus part, which servo device comprises a servo wheel having at least one recessed portion, which faces a motor-driven wheel in a rest position of the servo wheel, which servo wheel further carries an eccentric cam and at least one latching projection, which eccentric cam is subjected to a starting torque produced by spring force in the rest position of the servo wheel, which servo device further comprises a relay-armature member which is pivotable between a latching position and an inoperative position and which carries a soft-iron element which in the rest position of the servo wheel is attracted by an impulse relay and thereby maintains the relay-armature member in the latching position, in which position a stop projection on the relay-armature member cooperates with the latching projection on the servo wheel, so that the stop projection keeps the servo wheel latched in the rest position, whilst after a brief electrical energi-

zation of the impulse relay the relay-armature member is pivoted under spring force from the latching position to the inoperative position, in which inoperative position the stop projection is clear of the latching projection and, under the influence of the starting torque exerted on the eccentric cam, the servo wheel is rotated, the circumference of the servo wheel engages the motor-driven wheel, and the servo wheel is driven by the motor to position the apparatus part, after which the latching projection cooperates with a reset projection on the relay-armature member, so that the relay-armature member is returned against spring force from the inoperative position to the latching position, subsequently the latching projection again abuts against the stop projection, and the stop projection again latches the servo wheel in the rest position, characterized in that for moving the apparatus part from a first position, corresponding to a rest position of the apparatus part, to a second position, corresponding to an operating position of the apparatus part, and back to said first position the servo device further comprises:

first means for determining which of the two positions the apparatus part occupies, and

second means having an input coupled to an output of the first means and having an output coupled to the impulse relay, which second means are capable of supplying a brief electric energizing signal to the impulse relay at the instant at which the power supply is cut off if the apparatus part is in the second position, but not at said instant if the apparatus part is in the first position.

4,649,441

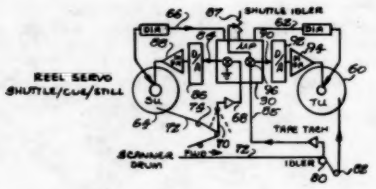
HEAD REEL SERVO SYSTEM IN A RECORDING AND/OR REPRODUCING APPARATUS

Kenneth Louth, Los Altos, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 364,652, Apr. 2, 1982, abandoned. This application Sep. 27, 1984, Ser. No. 655,983

Int. Cl.[4] G11B *15/18*

U.S. Cl. 360—71 **25 Claims**



1. In a magnetic tape recording and reproducing apparatus of the type which has a supply reel and a take-up reel for carrying magnetic tape, said apparatus being selectively operable in operating modes including normal speed reproducing, slow motion reproducing, stop motion reproducing, shuttle and record, a servo control system for controlling the drive motors of said take-up and supply reels, said servo control system comprising:

means for selectively driving a take-up reel motor in one of the forward and reverse directions;

means for selectively driving a supply reel motor in one of the forward and reverse directions;

means for providing output signals that are indicative of the rotational velocity of said take-up reel;

means for providing output signals that are indicative of the rotational velocity of said supply reel;

means for providing output signals that are indicative of the longitudinal tape speed; and

processing means for receiving the output signals from one of said reel velocity indication and for controlling one of said driving means in accordance with said diameter, wherein said longitudinal tape speed output signal providing means comprises a tachometer operably associated with an idler roller, said tachometer providing a predetermined number of output pulses per unit distance of tape travel, and wherein said driving means respectively apply a load current to said motors and further including means for monitoring the value of the load current applied to each of said reel motors and a movable arm for controlling the tension of the tape between the two reels, said processing means receiving said load current values and providing output signals to said movable arm for adjusting the tension and thereby maintain the load current within predetermined limits.

4,649,442

AUTOMATIC PROGRAM SELECTOR OF A VIDEO TAPE RECORDER

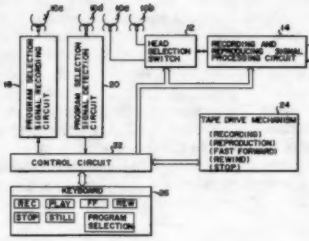
Hideo Kunii, and Katsumi Matsumoto, both of Fukaya, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 24, 1986, Ser. No. 822,134

Claims priority, application Japan, Jan. 26, 1985, 60-13075

Int. Cl.[4] G11B *15/00*

U.S. Cl. 360—72.2 **5 Claims**



1. An automatic program selector of a video tape recorder in which a magnetic tape is drawn out from a cassette in a normal-speed travel mode, and is not in a high-speed travel mode, comprising:

program selection signal recording means for recording a program selection signal on a magnetic tape to correspond with a program recording portion;

program selection signal reproducing means for reproducing the program selection signal in the high-speed travel mode;

external operation means having operation means for requesting at least program selection mode, high-speed travel mode and normal-speed travel mode, for producing a request signal in accordance with the selected mode;

first control means connected to said external operation means for producing, in accordance with the program selection request signal from said external operation means, a signal for driving the magnetic tape at high speed;

program selection signal detection means connected to said reproducing means for detecting the reproduced program selection signal from said reproducing means;

second control means connected to said program selection signal detection means for producing a first control signal for temporarily stopping the magnetic tape, and thereafter producing a second control signal for driving the magnetic tape at normal speed;

time count means which starts counting in response to the first control signal and produces a predetermined time elapse signal after the count has reached a value corresponding to a predetermined period of time; and

third control means for detecting the request signal from said external operation means for the predetermined period of time in the normal-speed travel mode set by the second control signal, so as to continue the normal-speed travel mode upon supply of the normal-speed travel re-

quest signal, and to produce a third control signal for resuming the high-speed travel mode in response to the predetermined time elapse signal if no request signal is supplied in the predetermined period of time.

4,649,443

METHOD OF PRECISE MANUFACTURING OF A TAPE-SCANNING DEVICE FOR OBLIQUE TRACK MAGNETIC RECORDING-REPRODUCING APPARATUS

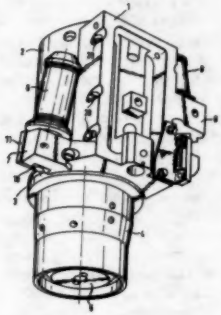
Manfred Hescher, Weiterstadt, and Heinrich Rosignol, Rossdorf, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 30, 1984, Ser. No. 605,682

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1983, 3355844

Int. Cl.[4] G11B *5/027*

U.S. Cl. 360—84 1 Claim



1. Method of making a scanning device for the recording and/or reproducing of broad band signals respectively on and from a magnetic tape by the oblique track method, comprising a stationary guide drum transversely divided into two parts, for guiding a magnetic tape helically therearound about an angle of less than 360°, a revolving head wheel disposed in a slot of the transversely divided drum and having at least two magnetic heads thereon for scanning the tape running obliquely across the scanning path of the heads and an elongated drum guide for fixing the position and orientation of the two drum parts, set method comprising:

making said drum guide (1) of a light metal alloy in a configuration providing a cylindrical hollow for facing said parts (2, 3) of said guide drum (1) with pairs of seating surfaces (14,15; 16,17) provided on said drum guides respectively for said drum part, which pairs are spaced from each other axially, the seating surfaces of each pair being spaced from each other circumferentially;

as a final shaping step for said drum guide, shaping the drum guide at least in a region including said seating surfaces by electric spark erosion, whereby said surfaces and other portions shaped by spark erosion are hardened, and

assembling said drum guide with said guide drum parts by means of radial fastening elements (20) fastening said drum guide to said guide drum part, said radial fastening elements passing through said seating elements, whereby said drum parts are firmly seated on said seating elements of said drum guide in portions of said drum parts located outside of said angle of less than 360° around which said magnetic tape is to be guided.

4,649,444

DISK SUPPORT DEVICE HAVING DEFORMATION LIMITING MEMBER

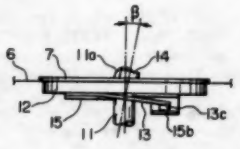
Akira Ichihara, Kakuda, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Jan. 16, 1985, Ser. No. 692,289

Claims priority, application Japan, Jan. 17, 1984, 59-4476[U]

Int. Cl.[4] G11B *5/016*

U.S. Cl. 360—99 3 Claims



1. In a disk support device having a rotatable shaft, a turntable mounted on said rotatable shaft for supporting a disk on one surface thereof, said disk having a central hub provided with a central hole positioned on said shaft and a radially spaced second support hole, said turntable having a radially spaced hole positioned to align with said second support hole of said hub, and a positioning pin supported on one end of a leaf spring mounted on an opposite surface of said turntable and adapted to project under the resiliency of said leaf spring through said hole of said turntable into said second support hole of said hub in order to engage the disk for rotation with said turntable,

the improvement wherein a stopper is mounted to said opposite surface of said turntable having a stopper portion spaced a predetermined distance from said opposite surface, and said leaf spring has an engaging portion interposed between said opposite surface and said stopper portion for limiting the extent of deformation of said projecting pin under the resiliency of said leaf spring.

4,649,445

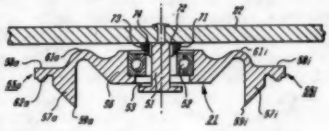
FLOATING COLLET SUSPENSION FOR FLOPPY DISK DRIVES

David R. Sheriff, Campbell, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 30, 1984, Ser. No. 605,521

Int. Cl.[4] G11B *5/016*

U.S. Cl. 360—99 5 Claims



1. In a floppy disk drive having a rotatably driven spindle, a collet, load means for applying a generally axial load force to said collet for clamping recording media to said spindle, and a support shaft for suspending said collet from said load means; said collet being journalled for rotation on said support shaft, and said load force being distributed by said collet about a center of action; the improvement comprising

a ball joint disposed between said load means and said collet for enabling said collet to follow any dynamic perturbations in the rotation of said spindle, said shaft extending in opposite directions from said ball joint axially of said shaft, and said ball joint including a single hemispherical bearing having a generally planar base oriented to engage said load means and a generally hemispherical bearing surface oriented to engage said collet, whereby said collet rides on said hemispherical bearing surface while following the

dynamic perturbations of said spindle, thereby dynamically stabilizing the center of action of said load force with respect to said spindle.

4,649,446

SWITCHING MECHANISM FOR THE DECK OF A MAGNETIC-TAPE-CASSETTE APPARATUS

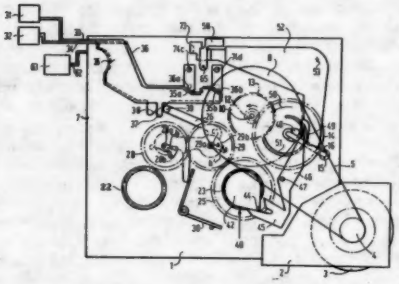
Arnim Deutsch, and Henricus M. Ruyten, both of Wetzlar, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 16, 1985, Ser. No. 691,994

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1984, 3401691

Int. Cl.[4] G11B *5/54, 15/00*

U.S. Cl. 360—105 **12 Claims**



1. A switching mechanism for a magnetic-tape-cassette deck comprising:

a head-mounting plate which can be moved forwards and backwards relative to the magnetic tape in a cassette which is inserted into the deck and is to be scanned,

a tape transport means, and a drive switch for actuating said transport means,

means for latching said plate in a forward position in a play mode of operation, and for unlatching the plate when the end of the tape is reached,

a depressible actuating rod having a guide slot for unlatching the plate upon depression of the rod, and a switching profile for actuating said drive switch, and

means, responsive to unlatching of said plate, for moving the plate back under spring pressure to a standby position in which the cassette remains inside the deck,

characterized in that said plate carries a pivotable actuating member arranged such that, when said member is in a center position during return of said plate to the standby position, said member switches off the drive switch; and such that, when in a first pivotal position, said member does not influence said drive switch,

said actuating member has a switching surface arranged such that, when said member is in the center position, said switching surface switches off the drive switch as the head-mounting plate returns to the standby position,

said rod comprises a stop arranged such that, upon movement of the rod in a direction of depression after redepression, said stop moves the actuating member from said center position to a first pivotal position, and

the deck comprises a servomechanism for moving the plate from the standby position to a play position, and

means for switching on said drive switch after said redepression when said rod moves back in the opposite direction.

4,649,447

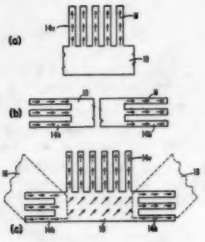
COMBED MR SENSOR

Shiezen Huang, San Jose, and Otto Voegeli, Morgan Hill, both of Calif., assignors to International Business Machines, Armonk, N.Y.

Filed Aug. 15, 1985, Ser. No. 765,999

Int. Cl.[4] G11B *5/127*

U.S. Cl. 360—113 **7 Claims**



1. A magnetic transducer comprising a magnetoresistive element for reading magnetically recorded information from a magnetic medium characterized in that said magnetoresistive element comprises an elongated member formed of a magnetic material having a predetermined height measured in a direction normal to the magnetic medium from a first edge of said magnetoresistive element which is adapted to face the recording medium and a plurality of elongated attachments contiguous with and of the same material as said magnetoresistive element, said elongated attachments having a predetermined width, a length substantially greater than said width, a predetermined spacing between adjacent ones of said elongated attachments, and being unidirectionally magnetized along their length so that a bias is produced to obtain a substantially linear component in magnetoresistive response in said magnetoresistive element so that previously recorded information is read from said medium with optimum sensitivity and so that Barkhausen noise is suppressed.

4,649,448

THIN FILM MAGNETIC HEAD HAVING A SLIDING SURFACE

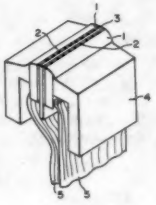
Hiroyasu Nakajima, Odawara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 4, 1984, Ser. No. 616,814

Claims priority, application Japan, Jun. 3, 1983, 58-97797; Jun. 3, 1983, 58-97798

Int. Cl.[4] G11B *5/14, 5/22*

U.S. Cl. 360—122 **3 Claims**



1. In a thin film magnetic head having a thin film on a substrate to form a magnetic circuit associated with a recording medium, the improvement wherein at least a sliding surface of said substrate opposing said recording medium is made of a material having a coefficient to thermal conductivity which is sufficient to carbonize a binder of said recording medium when

said magnetic head slides on said recording medium; said material consisting essentially of ZrO_2.

4,649,449

PERPENDICULAR MAGNETIC HEAD

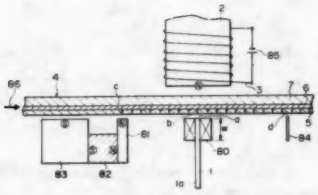
Takeshi Sawada; Yasushi Toda, both of Yokohama, and Hirokazu Goto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 366,077, Apr. 6, 1982, abandoned. This application Feb. 25, 1985, Ser. No. 705,049

Claims priority, application Japan, Apr. 15, 1981, 56-55525; Apr. 15, 1981, 56-55526; Apr. 28, 1981, 56-63397; Apr. 28, 1981, 56-63398; Apr. 28, 1981, 56-63399; May 28, 1981, 56-80194

Int. Cl.[4] G11B *5/17, 5/127*

U.S. Cl. 360—123 26 Claims



1. A perpendicular magnetic head operable in cooperation with a magnetic recording medium having a planar magnetizable recording surface and that has been perpendicularly magnetized in a predetermined direction, said head comprising:

a principal magnetic pole including a magneto-resistive element and mountable so as to face said surface of the magnetic recording medium;

an auxiliary magnetic pole made of a magnetic material and mountable so as to face a second surface of said magnetic recording medium, said auxiliary magentic pole being magnetically connected with said principal magnetic pole;

a coil wound around said auxiliary magnetic pole; and

a permanent magnet disposed on and in magnetic communication with said auxiliary magnetic pole between the magnetic recording medium and said auxiliary magnetic pole.

7. A perpendicular magnetic head operable in cooperation with a multisided magnetic recording medium driven by driven means in a running direction and which has been magnetized in a predetermined direction perpendicular to the running direction, said head comprising:

a plurality of magnetic poles, including at least first and second magnetic poles, mountable in opposition to one side surface of the magnetic recording medium for magnetizing the magnetic recording medium which has been perpendicularly magnetized, in a predetermined direction substantially perpendicular to the running direction;

a plurality of coils, for energizing said plurality of magnetic poles, including at least first ans second wires each wound about and forming coils on each of said poles, wherein said first first and second wires are wound on to said first and second magnetic poles such that said first and second wires are wound in the same direction on said first magnetic pole and in the directions opposite to each other on said second magnetic pole; and

a third magnetic pole mounted in opposition to said first magnetic pole and having a plurality of poles arranged to confront another side surface of the magnetic recording medium.

4,649,450

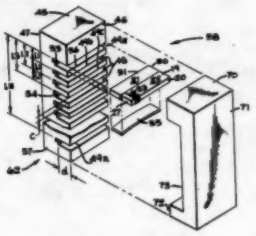
MODULAR MULTICHANNEL MAGNETIC HEAD ASSEMBLY WITH ACCURATE CHANNEL LOCATIONS

George A. Linke, San Francisco, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Dec. 12, 1984, Ser. No. 680,873

Int. Cl.[4] G11B *5/10*

U.S. Cl. 360—129 12 Claims



1. A modular multichannel magnetic head assembly comprising:

a transducer holder of a nonmagnetic material having a plurality of parallel grooves, each groove having two opposite parallel surfaces defining a width thereof, one of said surfaces being a reference surface, said reference surfaces being spaced at a predetermined distance from each other;

a plurality of individual magnetic transducers, each having a first and a second opposite surface defining a transducer width smaller than a width of said groove;

one said transducer arranged in each groove with said first surface abutting said reference surface of said groove;

locating means provided in each said groove adjacent said second surface of said transducer for urging said first surface of said transducer against said reference surface; and

means for joining said transducers with said holder.

4,649,451

MAGNETO-OPTICAL RECORDING MEDIUM HAVING ALTERNATELY-LAYERED HIGH AND LOW REFRACTIVE INDEX LAYERS

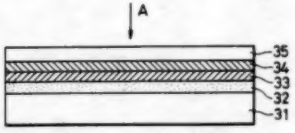
Yasuo Tomita, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1983, Ser. No. 535,699

Claims priority, application Japan, Sep. 27, 1982, 57-168121; Sep. 27, 1982, 57-168122

Int. Cl.[4] G11B *5/74*

U.S. Cl. 360—131 10 Claims



1. A magneto-optical recording medium comprising:

a substrate;

a magnetic thin film formed on the substrate for recording information and for reproducing the recorded information by the irradiation of a light beam on said thin film; and

a multi-layered dielectric layer for reducing the reflection factor of a surface of said thin film to the light beam incident thereon, said dielectric layer comprising a dielectric regulating layer formed on said thin film in contact

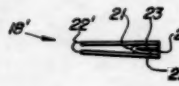
therewith, said dielectric regulating layer having an optical film thickness of substantially a quarter or a half of the wavelength of said light beam, and an alternately-layered dielectric layer formed on said regulating layer, said alternately layered dielectric layer including at least one set of alternately-layered high and low refractive index layers, each of said high and low refractive index layers having an optical film thickness of substantially a quarter of the wavelength of said light beam.

4,649,452

DISKETTE CLIP

William H. Brugman, 317 Busch St., Muscatine, Iowa 52761

Filed Jun. 20, 1985, Ser. No. 746,697
Int. Cl.[4] G11B *23/04*
U.S. Cl. 360—133 2 Claims



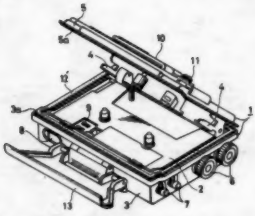
1. For use with an information disk assembly of the type including a square jacket containing a disk and having in one edge thereof parallel to the line of movement of the assembly into and out of a disk drive a notch extending inwardly from and opening outwardly at the edge: an erasure-preventing clip, comprising a U-shaped member having a bight means dimensioned to fit the notch and a pair of relatively rigid legs joined to the bight means and extending inwardly therefrom, said legs respectively having inner flat faces spaced apart on the order of the thickness of the jacket, said faces respectively having areas substantially greater than that of the cross-section of the bight means so that in use the faces respectively overlie substantial notch-bordering areas of opposite sides of the jacket, the outer edges of the legs and bight means being aligned so as not to project beyond the aforesaid edge of the jacket when the clip is in place on the jacket, the bight means forming a biased hinge interconnecting the rigid legs for movement toward and away from each other, the bias in the hinge being such as to urge the legs toward each other so as to squeeze onto the jacket.

4,649,453

CASSETTE TAPE PLAYER HAVING SEALING MEANS

Susumu Iwasawa, Ohmiya, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 26, 1984, Ser. No. 574,157
Claims priority, application Japan, Feb. 8, 1983, 58-17935[U]; Feb. 19, 1983, 58-23589[U]
Int. Cl.[4] G11B *17/00*; B65D *53/00*
U.S. Cl. 360—137 10 Claims



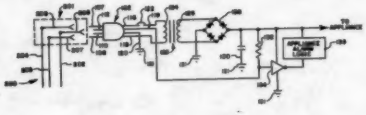
1. A cassette tape player having an exterior case which comprises a first structural member containing a major part of an internal mechanism including, a driving device for driving a cassette tape and having a first cut end at the peripheral edge thereof, a second structural member engageable with said first structural member and having an opening and closing movement therewith and having a second cut end at the peripheral edge thereof, said second cut end engaging said first cut end when said second structural member is closed to said first member, and an elastic seal member mounted in a groove which is provided in at least one of said first and second cut ends so as to be placed between said first and second structural members to seal the exterior case, and a limiting member provided between said elastic seal member and the inside of said groove and mounted so as to prevent said elastic seal member from being excessively deformed between said first and second structural members when said second member is closed with said first structural member.

4,649,454

APPARATUS AND METHOD FOR DETECTING AN OPEN GROUND CONNECTION

Arvin O. Winterton, 1133 W. 6th North, Salt Lake City, Utah 84116

Filed Oct. 9, 1984, Ser. No. 659,370
Int. Cl.[4] H02H *9/00*
U.S. Cl. 361—50 35 Claims



1. An apparatus that detects an open ground connection occurring anywhere between a chassis of an electrical appliance and a grounding terminal of a receptacle, said apparatus comprising:

a plug comprising a grounding blade and a sensing blade removably connectable in common to said grounding terminal of said receptacle, said plug further comprising means for electrically isolating said grounding blade and said sensing blade from each other, and a plurality of other blades removably connectable to current supplying terminals of said receptacle;

a cable comprising a grounding conductor and a sensing conductor connected to form a closed current path running from said grounding blade at said grounding terminal at said receptacle, to said appliance chassis and back to said sensing blade at said grounding terminal, said grounding conductor being electrically connected to said grounding blade and to said appliance chassis, and said sensing conductor being electrically connected to said sensing blade and to a hot conductor providing power to said electrical appliance whereby said closed current path between said grounding and sensing conductors is formed when said grounding and sensing blades are plugged into said grounding terminal of said receptacle, and said cable further comprising a plurality of other conductors connected to said plurality of other blades; and

a detection and alarm circuit comprising means for continuously monitoring and automatically detecting when said closed current path fails to make connection with ground.

4,649,455

RATING PLUG FOR MOLDED CASE CIRCUIT BREAKER

Graham A. Scott, Avon, Conn., assignor to General Electric Company, New York, N.Y.

Filed Apr. 28, 1986, Ser. No. 856,884
Int. Cl.[4] H02H *3/05*
U.S. Cl. 361—93 9 Claims

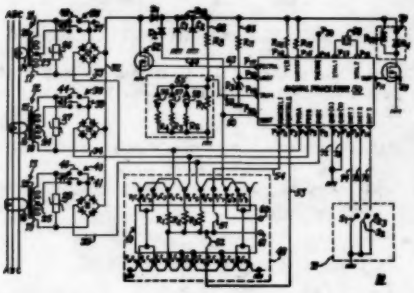
1. An electronic trip unit for molded case circuit breakers comprising:

current sensing transformers having a secondary winding sampling electric current through a protected circuit to provide a sample current value;

signal processor means for comparing said sample current value to predetermine overcurrent values to determine whether to provide a trip output signal based upon said comparison;

rating plug circuit means comprising a plurality of spring connectors electrically connected with said signal processor for developing a voltage representation of said sampled current value;

said spring connectors each comprising first and second legs,



said first and second legs being spring-loaded together in electrical contact with each other; and

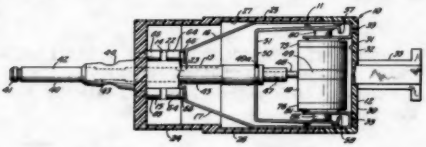
a first plurality of said conductive pads becoming electrically connected with said first legs when said rating plug is connected with said rating plug circuit and said first and second legs becoming electrically disconnected from each other, said first plurality of conductive pads arranged on said rating plug and contacting said first legs before said second plurality of conductive pads contact said second legs.

4,649,456

THREE ELEMENT GAS TUBE PROTECTOR MODULE

Paul V. De Luca, Plandome Manor, N.Y.; Paul Shaskan, Stamford, Conn., and Michael Belle-Oudry, Centereach, N.Y., assignors to Porta Systems Corp., Syosset, N.Y.

Filed Jun. 30, 1986, Ser. No. 883,517
Int. Cl.[4] H02H *3/20*
U.S. Cl. 361—119 **3 Claims**



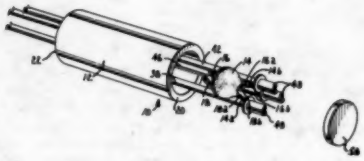
1. An improved subscriber circuit protector module of three element gas tube type comprising: a housing element and cap element defining a hollow void having a principal axis for containing electrically conductive components therein, a ground pin assembly including an elongated ground pin and a generally U-shaped ground clip carried by said ground pin adjacent at an inwardly disposed end of said ground pin, said ground clip including a base wall and a pair of flexible longitudinally extending walls, the free ends of said walls terminating in inwardly extending contact flanges; a plurality of long and short contacts, a pair of symmetrically arranged grounding contacts, each of said grounding contacts including a first end contact engaging said long and short contacts, a longitudinally extending portion disposed parallel to and in spaced relation to said longitudinally extending walls of said ground clip, an inwardly extending portion disposed parallel to a corresponding inwardly extending flange on said ground clip, and an elongated second end contact overlying said flange to define an interstice between the gas tube end terminal contacts and said longitudinally extending wall; a planar insulation member and a solder pellet disposed within said interstice to maintain said inwardly extending contact flanges of said ground clip in spaced relation relative to said second end contact of said grounding contacts; and a three element gas tube disposed between said end terminal contacts and electrically communicating therewith, said gas tube having a centrally disposed contact element communicating with said ground pin; whereby, upon the occurrence of a sustained current surge in said subscriber circuit sufficient to melt said solder pellet, said ground clip and said grounding contacts complete a grounding circuit bypassing said gas tube.

4,649,457

SURGE PROTECTION DEVICE

Laurel C. Talbot, and Wilbur T. Reed, both of Springfield, Mo., assignors to B. H. Tytewadd Marketing, Incorporated, Springfield, Mo.

Continuation of Ser. No. 581,065, Feb. 17, 1984, abandoned.
This application Oct. 3, 1985, Ser. No. 783,785
Int. Cl.[4] H02H *9/04*
U.S. Cl. 361—127 **11 Claims**



1. In a wiring complex such as an electrical power system or telephone system having an incoming conductor line equipped with an overload protector and equipment on the incoming conductor line at a location downline from the overload protector, a surge protection device comprising:

a normally interrupted electrical shunt circuit connected with said incoming conductor line at a location thereon between the overload protector and the downline equipment, said shunt circuit having a completed condition establishing a short circuit path for power on the incoming line;

a varistor in said electric shunt circuit having a nonconductive state at voltages below a preselected voltage level corresponding to surge voltages applied to the incoming line to normally effect interruption of said electric shunt circuit to permit application of power to the downline equipment, said varistor having a conductive state at voltages above said preselected level to complete said shunt circuit and establish said short circuit path immediately upon application of surge voltages to the incoming line, said varistor maintaining said short circuit path for a sufficient time to activate the overload protector, thereby preventing application of surge voltages to the downline equipment,

a nonflammable shell presenting a substantially enclosed chamber therein containing said varistor and at least a portion of said electric shunt circuit, said shell having a first end;

a pliable nonflammable filler material substantially filling said enclosed chamber, said varistor and portion of the shunt circuit being embedded in said filler material;

an end cap secured on said first end of the shell in an intentionally weakened manner to effect displacement of the end cap from said shell in the event of excessive pressure generated internally of the shell;

a plurality of wires in said portion of the shunt circuit and a plurality of connections between said wires, each of said

connections being soldered and each being between said varistor and said first end of the shell; and

a metal wire connector on each connection mechanically crimped on the wires leading to each connection, whereby excessive energy generated internally of the shell is partially absorbed by the wires.

4,649,458

CONTROL CIRCUITS FOR ELECTROMAGNETIC COUPLING APPARATUS

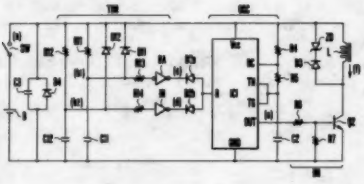
Shigeharu Arai, Ashikaga, and Minoru Otsuka, Kiryu, both of Japan, assignors to Ogura Clutch, Gunma, Japan

Filed Mar. 7, 1985, Ser. No. 709,159

Claims priority, application Japan, Mar. 9, 1984, 59-43879; Mar. 12, 1984, 59-45697

Int. Cl.⁴ F16D *27/16*

U.S. Cl. 361—152 **1 Claim**



1. A control circuit for electromagnetic coupling apparatus comprising:

a power source switch connected with a power source;

a timer which is started by an operation of said power source switch and comprises a first capacitor charged by said power source through a first resistor and said power source switch, a second capacitor charged by said power source through a second resistor and said power source switch, a buffer amplifier responsive to a potential at a junction between said first capacitor and said first resistor and an inverter connected to a junction between said second capacitor and said second resistor;

an oscillator which starts to send out a pulse shaped oscillation output in response to the operation of said power switch and stops sending out of said oscillation output in response to a time up of said timer; and

a drive circuit which intermittently passes current through an exciting coil of said electromagnetic coupling apparatus in accordance with said oscillation output of said oscillator and continuously passes current through said exciting coil when said oscillation output is stopped.

4,649,459

ROTARY ELECTRIC DEVICES

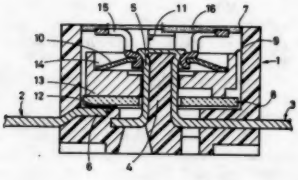
Yukihiro Azuchi, Sabae, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Dec. 6, 1984, Ser. No. 678,696

Claims priority, application Japan, Dec. 12, 1983, 58-234685

Int. Cl.⁴ H01G *5/06*

U.S. Cl. 361—293 **17 Claims**



1. An electric device comprising a rotary mechanism portion including rotor means and stator means contained in a case having an opening for receiving a tool for rotating said rotor means;

said electric device including a cover sheet formed in a state bonded to the inner peripheral surface of an edge portion defining said opening for closing said opening; and

said cover sheet being formed of a material having elastic and heat resisting properties, so as to be easily breakable for receiving such tool through said cover sheet.

4,649,460

SINGLE-IN-LINE INTEGRATED ELECTRONIC COMPONENT

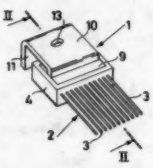
Giuseppe Marchisi, and Carlo C. De Martiis, both of Milan, Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Catania, Italy

Filed Feb. 13, 1985, Ser. No. 701,221

Claims priority, application Italy, Feb. 17, 1984, 19668 A/84

Int. Cl.⁴ H01L *23/02*

U.S. Cl. 361—386 **2 Claims**



1. A single-in-line integrated electronic component comprising:

a metallic frame provided with electric contacts,

an insulating package molded on said metallic frame to form an inner space,

a heat dissipator at the bottom of said inner space,

a semiconductor chip mounted on said heat dissipator in said inner space and electrically connected to said contacts, and

an insulating cover arranged at the top of said inner space and provided with a lateral extension having a turned end flush with the package bottom and at least one bore for the passage of a fastening means for the fastening of the component to a support surface.

4,649,461

GROUNDING CONSTRUCTION FOR MULTILAYER PRINTED CIRCUIT BOARDS

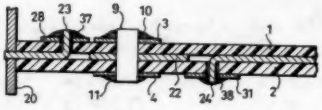
Shigetoshi Matsuta, Soma, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Jan. 7, 1985, Ser. No. 689,389

Claims priority, application Japan, Dec. 28, 1983, 58-199136[U]

Int. Cl.⁴ H05K *1/14*

U.S. Cl. 361—415 **3 Claims**



1. A grounding construction for multilayered printed circuit boards comprising:

a pair of printed circuit boards, each comprising a layer of insulative material and an electrical circuit pattern printed on one side thereof, said printed circuit boards being disposed in parallel with their sides of insulative material

facing inwardly and their sides having printed circuit patterns thereon facing outwardly;

a metal grounding plate disposed in parallel between the insulative sides of said pair of printed circuit boards, said plate having at least a pair of tabs each formed by bending a cutout portion of said plate at an angle to the plane of said plate so as to extend in opposite side directions therefrom, said metal grounding plate being grounded to a chassis; and

at least one hole formed through the insulative layer of each of said pair of printed circuit boards for receiving a respective one of said pair of tabs therethrough, each of said tabs having a tip portion extending to the other side of the respective printed circuit board whereby it can be connected to a portion of the printed circuit pattern of said board for purposes of providing a grounding connection,

whereby the printed circuit pattern on each board can be grounded through the respective tab and to said common metal grounding plate independently of and electrically shielded from the printed circuit pattern of the other printed circuit board.

4,649,462

VIEWING ANGLE COLOR SENSITIVE LIGHTING ACCESSORY

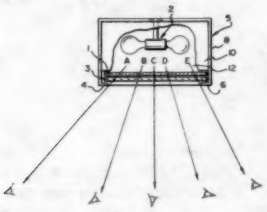
Jerzy A. Dobrowolski, Ottawa, and Lorne A. Whitehead, Vancouver, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Oct. 11, 1985, Ser. No. 786,696

Claims priority, application Canada, Oct. 12, 1984, 465387

Int. Cl.⁴ F21V *9/02*

U.S. Cl. 362—2 **8 Claims**



1. A viewing angle colour sensitive, lighting accessory, comprising:

(a) a sheet member for attachment to a light emitting source and capable of transmitting visible light therefrom fowardly towards an area from which transmitted light is to be perceived, and

(b) at least one optical interference multilayer coating on the sheet member, the material and thickness for each layer of the multilayers being selected so that the coating has different spectral transmittance characteristics at different angles of incidence of the visible light thereto so that light thereof of a particular colouration will be perceived transmitted through the coating at at least one range of viewing angles thereto,

(c) an electromagnetic radiation reflector securing the sheet member and extending rearwardly behind the sheet member and around the light emitting source, when the light source is mounted therein, so that visible light will be reflected by the reflector forwardly towards the area from which light is to be perceived, and

(d) securing means securing the sheet member to the electromagnetic radiation reflector.

4,649,463

LIGHTING APPLIANCE HAVING HIGH DIFFUSION POWER

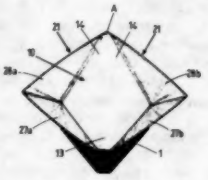
Mardick Baliozian, 10 E. Ontario St., Chicago, Ill. 60611

Filed Apr. 11, 1985, Ser. No. 722,717

Claims priority, application Switzerland, Apr. 16, 1984, 1898/84

Int. Cl.⁴ G03B *15/06*

U.S. Cl. 362—17 **8 Claims**



1. A lighting appliance having high diffusion power which is intended to be employed in particular for taking photographs, shooting films or the like, and comprising a triangular shaped lighting appliance base having a light source carried thereon and further including a diffusion screen carried upon said base in a position in front and to the sides of said light source, said diffusion screen having at least two triangular faces each one of said faces being directed both toward the front and towards the sides of the lighting appliance, the space delimited above said lighting appliance base being closed at the rear by a reflecting wall, said base having a top face forming a relfective surface, lateral cheeks each having a cheek face which is directed towards the diffusion screen forming a relfective surface and being positioned opposite to a face of said diffusion screen on each side thereof, said cheeks each having internal edges for securing said cheeks to the corresponding edge of the lighting appliance base and to a portion of said diffusion screen.

4,649,464

DUAL OPERATING MODE SWITCHING POWER SUPPLY

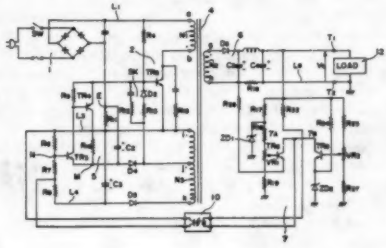
Masahiro Shono, Osaka, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jul. 17, 1985, Ser. No. 755,764

Claims priority, application Japan, Jul. 20, 1984, 59-151713; Aug. 6, 1984, 59-165376; Aug. 7, 1984, 59-165313

Int. Cl.⁴ H02M *3/335*

U.S. Cl. 363—21 **14 Claims**



1. A power supply circuit of a switching regulator type, comprising:

a converter transformer defined by a first winding for receiving input power from a DC source and second winding for producing output power;

switching transistor means for alternately making and breaking electric connection between said DC source and said

first winding by alternate turn on and off operations of said switching transistor means;

rectifying means connected to said second winding for rectifying said output power;

first error detecting means for detecting a drift in the rectified output DC current and for producing a first control signal;

second error detecting means for detecting a drift in the rectified output DC voltage and for producing a second control signal;

control means for controlling said on and off operation of said switching transistor means based on either one of said first control signal and said second control signal so as to stabilize the rectified output power; and

a mode selecting means coupled to said first and second error detecting means for changing the mode between a constant current mode in which the rectified output power is stabilized to provide a constant current for a relatively wide range of output DC voltage, and a constant voltage mode in which the rectified output power is stabilized to provide a constant voltage for a relatively wide range of output DC current.

4,649,465

VOLTAGE STABILIZER FOR A HIGH-VOLTAGE GENERATING CIRCUIT

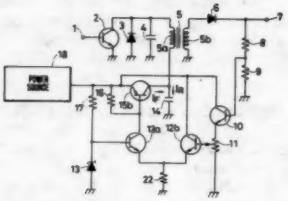
Kouji Kitou; Masashi Ohki, both of Yokohama, and Michitaka Ohsawa, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 24, 1985, Ser. No. 758,461

Claims priority, application Japan, Jul. 26, 1984, 59-154039; Sep. 10, 1984, 59-187927

Int. Cl.⁴ H02M 3/335

U.S. Cl. 363—21 **11 Claims**



1. In a voltage stabilizer for a high-voltage generating circuit comprising:

(1) a high-voltage generating circuit having a fly-back transformer, a high-voltage output transistor of which the collector is connected to a first terminal of the primary coil of the fly-back transformer, a resonance capacitor connected in parallel with said high-voltage output transistor, an inverse current absorbing capacitor connected to a second terminal of the primary coil of said fly-back transformer, and a rectifier connected in series with the secondary coil of said fly-back transformer;

(2) a detector circuit which is connected to the output terminal of said high-voltage generating circuit, and which detects the voltage produced by said high-voltage generating circuit;

(3) a reference voltage source which generates a reference voltage;

(4) control means which is connected to said high-voltage generating circuit, said reference voltage source, and to said detector circuit, and which so controls the power source voltage applied to the primary coil of said fly-back transformer that the difference between the reference voltage and the detected voltage is minimized; and

(5) a power source which is connected to said control means;

the improvement wherein said control means comprises:

a. a control transistor of the common-emitter PNP type of which the collector is connected to the second terminal of the primary coil of said fly-back transformer, and of which the emitter is connected to said power source; and

b. a differential amplifier circuit having a first transistor of which the base is connected to said reference voltage source and of which the collector is connected to the base of said control transistor, a second transistor of which the base is connected to said detector circuit and of which the emitter is connected to the emitter of said first transistor, and a resistor connected between the collector of said first transistor and said power source,

wherein the capacitance of said inverse current absorbing capacitor is selected to be sufficiently small to generate a voltage with a parabolic waveform.

4,649,466

METHOD AND CIRCUIT ARRANGEMEANT FOR OPERATING A HIGH VOLTAGE DIRECT CURRENT LINE BETWEEN TWO ALTERNATING VOLTAGE SYSTEMS

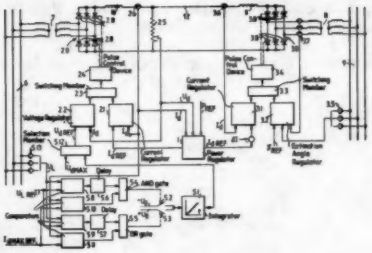
York Rogowsky, Berlin, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 13, 1984, Ser. No. 630,396

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1983, 3326947

Int. Cl.⁴ H02J 3/36

U.S. Cl. 363—35 **6 Claims**



1. In a system for controlling the direct current and direct voltage of a high voltage, direct current transmission link connected at one end to an alternating voltage system via a rectifier and at the other end to another alternating voltage system via an inverter, wherein a first circuit means is connected to the rectifier to regulate one of the direct current and direct voltage output of the rectifier, a second circuit means is connected to the inverter to regulate one of the extinction angle of and current through the inverter, and a power regulator provides a signal representing a desired current magnitude to the first and second circuit means, a method comprising:

regulating the direct voltage output of the rectifier with the use of a reference signal which defines a reference value and which is compared with the direct voltage output signal;

reducing the reference value of the reference signal as long as the alternating voltage in the system connected to the rectifier has a magnitude which lies above a predetermined voltage magnitude and as long as the direct current flowing through the transmission link lies below a given current limit magnitude; and

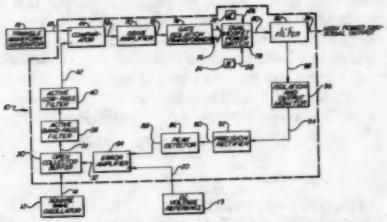
increasing the reference value of the reference signal as long as the alternating voltage in the system connected to the rectifier has a magnitude which lies below the predetermined voltage magnitude and the direct voltage of the transmission link lies below a given maximum voltage magnitude, or as long as the direct current in the transmission link lies above the given current limit magnitude.

4,649,467

HIGH EFFICIENCY MOSFET SINE WAVE GENERATOR

Richard V. Vesce, East Hampton, and John R. Torres, Somers, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 31, 1985, Ser. No. 760,849
Int. Cl.[4] H02M *1/12*
U.S. Cl. 363—41 **5 Claims**



1. Apparatus, responsive to a variable amplitude sinusoidal source which provides a sinusoidal modulating signal at a first frequency, the source being responsive to an error signal from said apparatus for varying the amplitude of the modulating signal in response to the error signal, and said apparatus responsive to a fixed amplitude triangle wave voltage source, which provides a bipolar triangle signal at a second frequency greater than the first frequency and at an amplitude greater than or equal to the amplitude of the modulating signal, said apparatus comprising:

comparator means, responsive at separate inputs thereof to the modulating signal and to the triangle signal for providing a low power modulated pulse train signal;

drive amplifier means, responsive to said modulated pulse train signal for providing an amplified modulated pulse train signal;

isolation transformer means, having a primary and two secondary windings, responsive at the primary thereof to said amplified modulated pulse train signal, for providing alternating isolated gate drive signals at the secondary windings;

a pair of complementary MOSFET power switches, each responsive at a gate input thereof to one but not the other of the alternating gate drive signals, one switch responsive to a positive DC source having a voltage magnitude equal but opposite in sign to a negative DC source connected to the other switch, for providing a modulated pulse train power output signal;

LC filter means, responsive to said modulated pulse train power output signal for providing a sinusoidal power output signal; and

error circuit means, responsive to said sinusoidal power output signal for comparing the magnitude thereof to a reference signal magnitude and for providing an error signal to the variable amplitude sinusoidal source for varying the amplitude of the modulating signal in inverse proportion to said sinusoidal power output signal so as to cause the voltage magnitude of said sinusoidal power output signal to vary in such a way as to tend to reduce the magnitude of the error signal to zero.

4,649,468

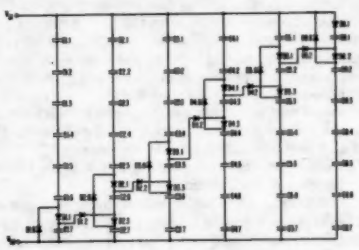
VOLTAGE DIVIDER CIRCUIT

Richard J. Cubbison, Jr., Westminster, Colo., assignor to AT&T Information Systems Inc., Holmdel, N.J.

Filed Nov. 6, 1985, Ser. No. 795,624
Int. Cl.[4] H02M *3/06*
U.S. Cl. 363—62 **7 Claims**

1. A method transforming an input voltage of V to an output voltage of (n/m)*V, where n>1, wherein said output voltage is applied to output terminals, comprising the steps of:

charging n sets of capacitors, each set containing m series connected capacitors of equal value, to said input voltage V;



discharging said n sets of capacitors via n'discharge paths, each of said discharge paths containing n series connected capacitors; and

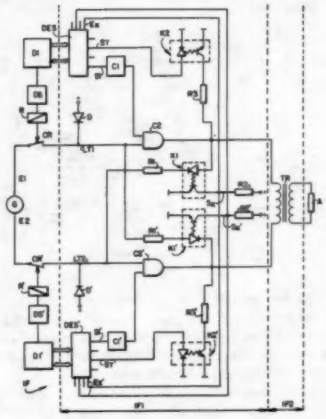
connecting said n+1 discharge paths to said output terminals.

4,649,469

INTERFACE FOR CONNECTING A COMPUTER SYSTEM TO AN ACTIVATOR MODULE

Jean-Francois Gabillet, Coye la Foret, France, assignor to Jeumont-Schneider Corporation, Puteaux, France

Filed Feb. 1, 1984, Ser. No. 575,860
Claims priority, application France, Feb. 3, 1983, 83 01672
Int. Cl.[4] G05B *15/08, 9/02;* G06F *7/34;* H02J *3/38*
U.S. Cl. 364—130 **18 Claims**



1. Apparatus for driving an activator module under control of a computer system, said apparatus comprising:

power circuit means for energizing said activator module, including first and second power transmission line means for transmitting power from an electrical power source to said activator module with different voltage levels on the respective power transmission line means,

switching means including first switch means capable of performing an AND logic function for closing and opening said first power transmission line means in response to command signals applied to command input means of said first switch means in order to engage and disengage said power source from said module,

command signal applying means including first command module means having output means connected to said command input means of said first switch means and having input means connected to said computer system

for applying said command signals to said command input means of said first switch means,

monitoring means including first monitoring module means having an input circuit connected to a section of said first power transmission line means which is switchably connected to said power source through said first switch means and having an output connected to said first command module means for monitoring power signal level states on said section of said first power transmission line means and for providing an output indicative of said states to said first command module means, and

test means connected for applying a test signal to said first monitoring module means,

said first command module means including comparator means for comparing a monitored power signal level state on said section of said first power transmission line means, as indicated by said output of said first monitoring module means, with a command state of said first command module means and including inhibiting means for preventing the application of a command signal to said command input means of said first switch means when the compared states do not agree.

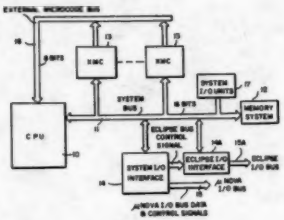
4,649,470
DATA PROCESSING SYSTEM

David H. Bernstein, Los Altos, Calif.; Edward M. Buckley, Watertown, Mass.; Roger W. March, Cupertino, Calif., and Ronald I. Gusowski, deceased, late of Framingham, Mass. (by Lloyd S. French, administrator), assignors to Data General Corporation, Westboro, Mass.

Continuation-in-part of Ser. No. 120,292, Feb. 11, 1980, abandoned. This application Oct. 20, 1982, Ser. No. 435,385

Int. Cl.[4] G06F *13/38*

U.S. Cl. 364—200 **4 Claims**



1. A data processing system comprising

a central processor unit connected to a system bus means having system operating timing and control characteristics for providing communication with one or more system units connected to said system bus;

a first input/output bus means having first operating timing and control characteristics which are different from those of said system bus means;

a second input/output bus means having second operating timing and control characteristics which are different from those of said first input/output bus means and from those of said system bus means;

interface means interconnecting said system bus means with said first input/output bus means and with said second input/output bus means for providing further communication with one or more first units via said first input/out bus means and with one or more second units via said second input/output bus means, said interface means including logic means responsive to an address of a unit with which it is desired that said system bus means communicate for determining which input/output bus means is required to be used in order to provide communication between the addressed unit and said system bus means and for permitting the direct transfer of data therebetween without intermediate storage thereof;

said interface means further includes polling logic means for identifying each of said one or more second units which are present on said second input/output bus means;

poll store means responsive to said polling logic means for storing information which indicates the presence of each of said identified second units; and

means responsive to the information stored in said poll store means for controlling the operation of said interface means to provide access from said system bus means to an addressed unit via said second input/output bus means when said addressed unit is identified as present on said second input/output bus means and for controlling the operation of said interface means to provide access from said system bus means to an addressed unit via said first input/output bus means when said addressed unit is not identified as present on said second input/output bus means.

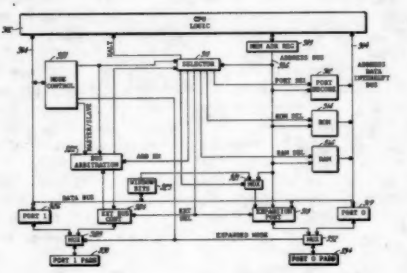
4,649,471
ADDRESS-CONTROLLED AUTOMATIC BUS ARBITRATION AND ADDRESS MODIFICATION

Willard S. Briggs, Carrollton; Alan D. Gant, Dallas; Parveen K. Gupta, Carrollton, and Isadore S. Ferson, Austin, all of Tex., assignors to Thomson Components-Mostek Corporation, Carrollton, Tex.

Filed Mar. 1, 1983, Ser. No. 471,095

Int. Cl.[4] G06F *13/18*

U.S. Cl. 364—200 **4 Claims**



1. A memory-mapped microprocessor integrated on a single chip including an on-chip memory and a plurality of on-chip input/output ports, adapted for connection to an external bus (**210, 222**) and thence to at least one off-chip memory, and having means for addresing a memory address space (**100**) that includes:

a memory address range for on-chip memory (**102, 104, 314, 316**),

a memory address range (**106**) for any off-chip memory (**212, 214**) and

a memory address range (**112**) for off-chip references,

passing through on-chip input/output ports (**318, 319, 324, 326**) when use of said external bus is requested, comprising on said chip

a CPU (Central Processing Unit) (**202, 302**);

at least one input/output port (**318, 319, 324, 326**);

an on-chip memory (**102, 104, 314, 316**);

at least one register (**303**) for storing an address in said memory address space;

a plurality of signal lines (**304, 306**) interconnecting said CPU, port, said on-chip memory and said memory address register (**303**);

a microprocessor selection means (**310**) connected to an output of said memory address register (**303**);

a memory expansion mode control (**320**), whose mode can change, during the course of a program by execution of a predetermined instruction thereof, to select which of said on-chip memory and said off-chip memory is addressed, thereby obviating delays due to external bus requests

when only on-chip memory is addressed, said memory expansion mode control being connected to said selection means (310) and

means (324) for controlling an external bus (210, 222) connected to said selection means (310) and to said at least one input/output port,

said microprocessor selection means (310) automatically testing a memory address stored within said register (303) to determine whether said address indicates an off-chip reference and hence requires use of said external bus, and responding to memory addresses within a predetermined off-chip range (106) by activating an on-chip bus control circuit (322, 410, 420, 430) which, in turn, arbitrates use of said external bus (210, 222), thereby permitting a user to mix on-chip and off-chip references without coding specific bus control instructions.

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MULTI-PHASE SUBROUTINE CONTROL CIRCUITRY

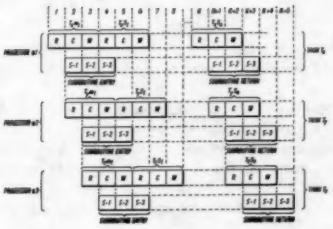
Dongsung R. Kim, Laguna Hills, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 231,554, Feb. 4, 1981, Pat. No. 4,467,410. This application Mar. 14, 1984, Ser. No. 589,298

The portion of the term of this patent subsequent to Aug. 21, 2001, has been disclaimed.

Int. Cl.⁴ G06F *9/30*

U.S. Cl. 364—200 **5 Claims**



1. In a cyclically operating data processing system which provides for the concurrent performance of a plurality of tasks in a staged manner over a plurality of cycles, wherein a task may include one or more subroutines for use in performing its respective task, subroutine control means comprising:

a multi-level return address means, one for each task, for storing return addresses for the respective task during performance thereof; and

return address control means commonly used by said plurality of tasks and including first, second and third means which are concurrently operable during a cycle;

said first means being operable during a cycle in response to a subroutine entry indication and a task identification indication provided by said system when a task enters a subroutine for determining a return address for the indicated subroutine,

said second means being operable during a cycle for storing a return address determined by said first means during a previous cycle in the multi-level return address storage means of the respective task; and

said third means being operable during a cycle in response to a subroutine entry return indication and a task identification indication provided by said system when a task arrives at the end of a routine for accessing a particular return address stored in the respective storage means of the identified task during a previous cycle for application to said system;

said return address control means operating during a cycle to permit the determining by said first means of a return address for a first task to be performed concurrently with the storing by said second means of a return address for a second task in its respective return address storage means, and also concurrently with the accessing by said third means of a return address for a third task from its respective return address storage means for transfer to said system, said data processing system choosing the particular tasks for which said first, second and third means operate over a plurality of cycles so as to permit the tasks to time-share use of said first, second and third means for subroutine control using a staging which conforms to the staging of tasks by said system.

4,649,473

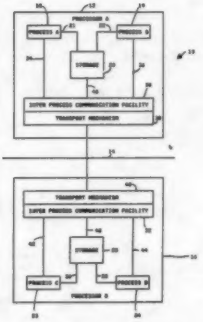
FLEXIBLE DATA TRANSMISSION FOR MESSAGE BASED PROTOCOLS

William E. Hammer, Rochester; Walter H. Schwane, Kasson, and Frederick J. Ziecina, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 17, 1985, Ser. No. 745,751

Int. Cl.⁴ G06F *9/06*

U.S. Cl. 364—200 **22 Claims**



14. An interprocess data transfer facility for transfer of data between a first process and a second process comprising:

first interface means coupled to the first process for receiving information representative of one or more work requests;

transport means coupled to the first interface means for transporting control information representative of the work request from the first interface means to the second process;

second interface means coupled to the second process and to the transport means for distilling a note representative of the work request from the control information; and

queue means coupled to the second process for queueing the note received from the second interface means such that the second process controls receipt of the actual work request in the order desired by the second process.

4,649,474

CHIP TOPOGRAPHY FOR A MOS DISK MEMORY CONTROLLER CIRCUIT

William H. Ambrosius, III, Mission Viejo, and Larry D. Rossean, Westminster, both of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Filed Sep. 23, 1983, Ser. No. 535,374

Int. Cl.⁴ G06Z *1/00, 13/00*

U.S. Cl. 364—200 **14 Claims**

1. A metal oxide semiconductor (MOS) chip for a disk memory controller circuit for coupling to external circuitry including a host processor and a buffer memory, said external circuity having signal lines including a parallel data bus, said chip for transferring data between an external disk memory having a disk and the processor or the buffer memory, said chip comprising:

(a) chip buffer circuitry adapted to couple the chip to the

signal lines of the external circuitry, said buffer circuitry including tristate data input/output (I/O) buffer circuitry for coupling the chip to the external data bus;

(b) data I/O buffer control circuitry for controlling the enabling of the tristate data I/O buffer circuitry;

(c) a microcontroller for controlling the functions of the chip;

(d) a register file coupled to the microcontroller and the data I/O buffer circuitry for storing control information received from the processor;

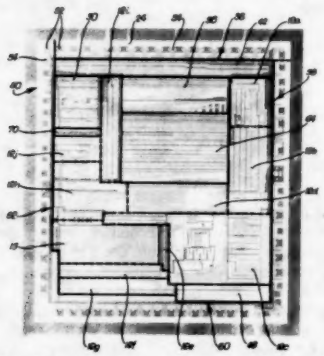
(e) a read-only-memory (ROM) coupled to the microcontroller, having memory locations for storing program instructions used by the microcontroller;

(f) drive control and unit select registers coupled to the microcontroller and the chip buffer circuitry for latching disk memory control information and disk memory select information;

(g) shift registers coupled to the chip buffer circuitry and the microcontroller for converting parallel data received from the processor or the buffer memory to serial data and for converting serial data from an external disk memory to parallel data;

(h) error checking circuitry coupled to the chip buffer circuitry and the shift registers, for detecting transmission errors in the data read from an external disk memory; and

(i) disk synchronization circuitry for synchronizing the operations of the chip with the rotational speed of the disk;



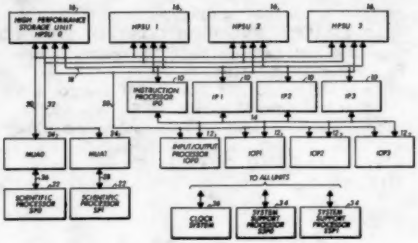
wherein the chip buffer circuitry forms a quadrilateral outer framework on the chip, and the data I/O buffer circuitry forms a first side of the quadrilateral outer framework; the data I/O buffer control circuitry is disposed between first and second corners of the chip buffer circuitry adjacent to the data I/O buffer circuitry; a first portion of the microcontroller is disposed adjacent to the data I/O buffer control circuitry and along a part of a second side of the chip buffer circuitry; the drive control and unit select registers are disposed adjacent to the first portion of the microcontroller and along a third side and within a third corner of the chip buffer circuitry; the ROM is disposed along a part of a fourth side of the chip buffer circuitry; a second portion of the microcontroller is disposed adjacent to the ROM, the first portion of the microcontroller and the drive control and unit select registers and within a fourth corner of the chip buffer circuitry; a third portion of the microcontroller is disposed adjacent to the ROM and the first portion of the microcontroller and along the fourth side of the chip buffer circuitry; the disk synchronization circuitry is disposed adjacent to the third portion of the microcontroller and along the fourth side of the chip buffer circuitry; the shift registers are disposed adjacent to and between the disk synchronization circuitry and the data I/O buffer control circuitry and along a part of the fourth side of the chip buffer circuitry; the third portion of the microcontroller is further disposed adjacent to the data I/O buffer control circuitry and the shift registers; the error checking circuitry is disposed between the first and third portions of the microcontroller and adjacent to the data I/O buffer control circuitry; and the register file is disposed between the first and third portions of the microcontroller and adjacent to the error checking circuitry.

4,649,475

MULTIPLE PORT MEMORY WITH PORT DECODE ERROR DETECTOR

James H. Scheuneman, St. Paul, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Apr. 2, 1984, Ser. No. 596,132
Int. Cl.[4] G06F *13/00, 11/00*
U.S. Cl. 364—200 **14 Claims**



1. For use in a multiple port memory system having addressable banks of storage modules, port selection through apparatus comprising:

multiple port request receiving means for receiving requests for access to the memory system;

priority means responsively coupled to said multiple port request receiving means for providing port code signals indicative of the request to be honored;

a plurality of port means coupled to a corresponding plurality of requestors;

multiplexor means commonly coupled to both said plurality of port means and said priority means, and said multiplexor means responsive to said port code signals and including means for generating decoded port code signals, each of said decoded port code signals providing information for selecting an associated one of said plurality of port means; and

port code checking means coupled to said multiplexor means and responsive to said decoded port code signals for providing decode error signals when said decoded port code signals indicate the simultaneous selection of more than one of said plurality of port means.

4,649,476

MICROCOMPUTER HAVING AN INTERNAL ADDRESS MAPPER

James M. Sibigtroth, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 31, 1983, Ser. No. 547,192
Int. Cl.[4] G06F *12/02, 13/00*
U.S. Cl. 364—200 **3 Claims**

1. In a microcomputer comprising:

an address bus for communicating addresses comprising at least a first set of address bits and a second set of address bits;

a first resource for performing a predetermined function in response to the coincidence of a first enable signal and a first predetermined address on said first set of address bits; and

a second resource for performing a predetermined function in response to the coincidence of a second enable signal

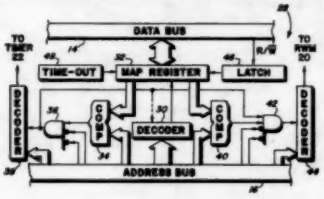
and a second predetermined address on said first set of address bits;

an address mapper comprising:

map register means for storing a first and second resource map address, each having the same number of bits as said second set of address bits;

first comparator means coupled to said map register and to said address bus, for comparing said first resource map address to said second set of address bits, and for providing said first enable signal to said first resource only when said second set of address bits is identical to said first resource map address; and

second comparator means coupled to said map register and to said address bus, for comparing said second resource map address to said second set of address bits, and for providing said second enable signal to said second resource only when said second set of address bits is identical to said second resource map address.



4,649,477

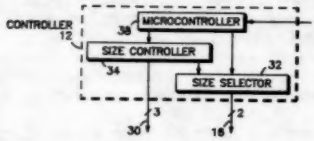
OPERAND SIZE MECHANISM FOR CONTROL SIMPLIFICATION

Douglas B. MacGregor, Sakyo, Japan, and William C. Moyer, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 27, 1985, Ser. No. 749,367

Int. Cl.[4] G06F 9/34

U.S. Cl. 364—200 **8 Claims**



1. In a data processor for performing selected operations on an operand having a selected one of a plurality of sizes, the data processor comprising

an instruction register for storing an instruction which selects the operation to be performed on the operand and the size of the operand;

an arithmetic and logic unit for performing at least one of the operations on the operand according to the size of the operand;

a bus controller for communicating the instruction to the instruction register from a resource external to the data processor, and for communicating the operand having the size between the arithmetic and logic unit and the external resource;

a controller, responsive to the instruction stored in the instruction register, for coordinating the bus controller, the instruction register and the arithmetic and logic unit to perform the selected operation on the operand;

the improvement comprising:

a size selector in the controller for explicitly selecting the size of the operand independent of the instruction in the instruction register and

a size controller in the controller for selectively enabling either the instruction register or the size selector to implicitly or explicitly select the size of the operand, respectively.

4,649,478

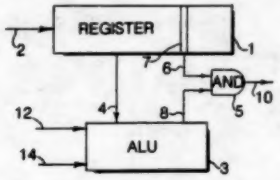
OPERATION CODE SELECTED OVERFLOW INTERRUPTS

William S. Worley, Jr., Saratoga, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 28, 1985, Ser. No. 750,626

Int. Cl.[4] G06F 9/34

U.S. Cl. 364—200 **1 Claim**



1. Apparatus for performing operations on a first operand and a second operand in response to a coded instruction, said apparatus comprising:

calculating means for receiving the first operand and the second operand, said calculating means responsive to a control signal for producing a resultant and for producing an overflow signal indicative of the occurrence of an overflow event;

register means coupled to the calculating means for storing the coded instruction and providing said control signal to the calculating means, said control signal derived from said coded instruction, and for providing a logic signal derived from the coded instruction, said logic signal having a first value if an interrupt function is defined and having a second value if an interrupt function is not defined; and

gating means coupled to said register means and to said calculating means for providing an interrupt signal when said logic signal is of said first value and said overflow signal indicates that an overflow event has occurred, the calculating means responsive to the interrupt signal to cause an interrupt of the operation defined by said coded instruction.

4,649,479

DEVICE DRIVER AND ADAPTER BINDING TECHNIQUE

Hira Advani; Larry K. Loucks, and Nancy L. Springen, all of Austin, Tex., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Feb. 28, 1985, Ser. No. 706,642

Int. Cl.[4] G06F 9/00

U.S. Cl. 364—300 **5 Claims**

1. A device driver and adapter binding technique in which an operating system having device drivers is run as a virtual machine on a virtual resource manager having device drivers of real and virtual devices comprising the steps of:

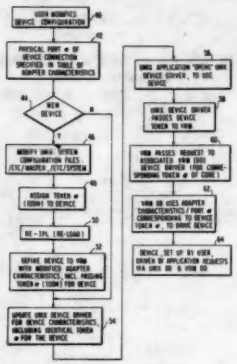
assigning a "token" to the virtual resource manager's device driver for the device to be bound to a device driver of said operating system;

creating a device dependent information file in said operating system corresponding to said device to be bound, said file including adapter dependent information for said device;

placing said "token" in a device driver of said operating system at the time said operating system is initiated; and

using said "token" placed in said device driver of said operating system to communicate with the corresponding

virtual resource manager device driver when said device driver of said operating system is opened to drive said



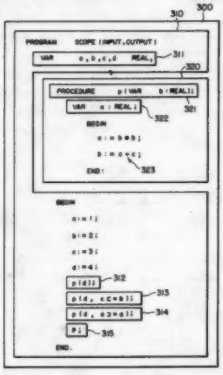
device, thereby binding the two drivers and using the device dependent information in said device dependent information file to drive the physical device.

4,649,480

METHOD OF PROCEDURES LINKAGE CONTROL

Masaru Ohki, Kodaira; Toshio Hirosawa, Machida; Junichi Kurihara, and Katsuto Miyazaki, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 28, 1985, Ser. No. 716,940
Claims priority, application Japan, Mar. 28, 1984, 59-58267
Int. Cl.[4] G06F *9/40*
U.S. Cl. 364—300 **6 Claims**



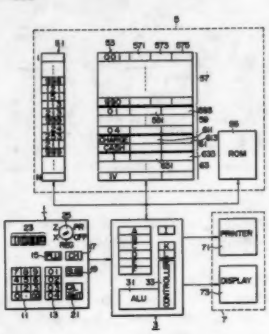
1. In a method of procedure linkage control including a first procedure for executing a first processing stage and a second procedure for executing a second processing stage by utilizing the result of processing of said first procedure, a method of procedures linkage control characterized in that a first variable used in said first procedure and a first variable used in said second procedure are regarded as being different variables and said first procedure is called using the value of a second variable as the value of said first variable used in said first procedure in response to a designation symbol when said designation symbol, said first variable to be used in common for both of said first and second procedures and said second variable used in said second procedures are designated.

4,649,481

ELECTRONIC CASH REGISTER WITH MEANS TO STORE AND CORRELATE DATA ON A CUSTOMER BY CUSTOMER BASIS

Hiroshi Takahashi, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jan. 9, 1985, Ser. No. 689,849
Claims priority, application Japan, Jan. 24, 1984, 59-9441
Int. Cl.[4] G06F *15/24*
U.S. Cl. 364—405 **20 Claims**



1. An electronic cash register comprising:

input means, having a plurality of keys for inputting commodity data on items purchased by customers and boundary code data representing a boundary between each two customers who purchase the items, said commodity date including predetermined commodity classification code data for each type of item,

memory means for storing the commodity data and the boundary code data input by said input means in an order input;

designating means for designating at least one commodity classification data and a condition thereof in order to determine the number of customers who purchase at least one item whose commodity classification code data satisfies said condition,

detecting means for detecting whether the commodity classification code data, designated by said designating means and satisfying said condition, are in each of data groups; and

counting means for counting the number of data groups which are detected by said detecting means to satisfy said condition designated by said designating means.

4,649,482

BRAIN ELECTRICAL ACTIVITY TOPOGRAPHICAL MAPPING

Gabriel Raviv, Des Plaines, and Gil Raviv, Deerfield, both of Ill., assignors to Bio-logic Systems Corp., Mundelein, Ill.

Filed Aug. 31, 1984, Ser. No. 646,613
Int. Cl.[4] A61B *5/04*; G06F *15/42*
U.S. Cl. 364—417 **28 Claims**

1. An apparatus for displaying a topographical map of brain electrical acitivity of a patient, comprising:

sensor means disposed on a patient's head for providing changeable amplitude sign input activity signals responsive to said brain electrical activity;

processing means responsive to said changeable amplitude sign input activity signals for providing an amplified and digitized form of said input activity signals;

means for providing a video output responsive to said amplified and digitized input activity signals, said video output incluidng a set of interpolated input activity signals for positions between the locations of said sensor means with said positions including selected locations along at least

two interpolated lines generated between adjacent pairs of lines formed by connecting the locations of said sensor means and at least two of said interpolated lines between each said adjacent pairs of lines being generated from distinguishable appropriate combinations of said input activity signals, said interpolated input activity signals generated line—by—line and displayed while a next successive adjacent line for display is being generated; and

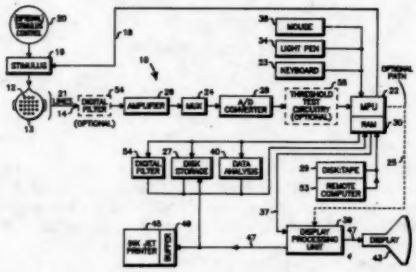
means for displaying said topographical map of said brain electrical activity responsive to said video output.

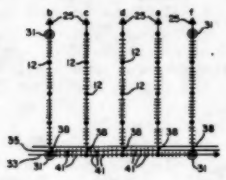
25. An apparatus for displaying a topographical map of EEG brain electrical activity in a plurality of frequency bands of a patient, comprising:

a plurality of electrode sensors disposed on a patient's head for measuring EEG input activity signals at each of said plurality of electrode sensors;

processing means connected to be responsive to said input activity signals for providing an amplified and digitized form of said input activity signals;

means for sampling said amplified and digitized form of said EEG inout activity signals at predetermined intervals responsive to said amplified and digitized form of said





input activity signals to provide sampled forms of said EEG input activity signals;

means for performing a Fourier transform of said sampled forms of EEG input activity signals responsive thereto to provide a frequency band energy output characteristic of the energy in each of said plurality of frequency bands;

computer means responsive to said frequency band energy output for generating a set of interpolated frequency band energy output signals for positions between the locations of said plurality of sensors, said output signals generated for said positions including selected locations along at least two interpolated lines generated between adjacent pairs of lines formed by connecting the locations of said sensors and at least two of said interpolated lines between each said adjacent pairs of lines being generated from distinguishable appropriate combinations of said input activity signals; and

display means for displaying said topographical map responsive to said frequency band energy output signals.

28. An apparatus for displaying a topographical map of brain electrical activity sensed by a plurality of electrode sensors disposed on a patient's head, wherein said electrode sensors provide an associated plurality of input activity signals, said apparatus comprising:

processing means for providing an amplified and digitized form of said plurality of input activity signals;

computer means for providing a video output responsive to said plurality of amplified and digitized input activity signals;

means for displaying said topographical maps of said brain electrical activity responsive to said video output; and

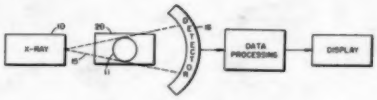
input means for supplying an input signal responsive to a user input and indicator means connected to be responsive to said input signal for actuating selected software programs to control said video output on said means for displaying, said indicator means able to select a line on said topographical map and actuate said computer means to display amplitudes of said input activity signals along said line.

4,649,483

METHOD FOR DETERMINING FLUID SATURATION IN A POROUS MEDIA THROUGH THE USE OF CT SCANNING

James R. Dixon, Jr., Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 1, 1984, Ser. No. 656,553
Int. Cl.[4] G01N *23/04;* G03B *41/16*
U.S. Cl. 364—422 **9 Claims**



1. A method for determining the multi-phase fluid saturation in a porous media, comprising the steps of:

(a) scanning a sample of said porous media with X-rays of differing energies,

(b) producing computed tomographic images of said sample at said differing energies,

(c) extracting the multi-phase fluid from said sample,

(d) scanning said fluid-extracted sample with X-rays of said differing energies,

(e) producing computed tomographic images of said fluid-extracted sample at said differing energies,

(f) scanning said extracted fluids with X-rays at said differing energies,

(g) producing computed tomographic images of said extracted fluids at said differing energies,

(h) determining the X-ray mass attenuation coefficients for said sample and each of the fluid phases of said extracted fluids at each of said differing energies from said computed tomographic images,

(i) determining the weight fractions of each of said fluid phases from said mass attenuation coefficients, and

(j) determining the volume fractions of each of said fluid phases by multiplying said weight fractions by the densities of the respective fluid phases.

4,649,484

AVIONIC CONTROL SYSTEM

Hans K. Herzog, Bellevue, and Seiya Sakurai, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 519,288, Aug. 1, 1983, Pat. No. 4,598,890.
This application Jul. 12, 1985, Ser. No. 754,330
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—424 **5 Claims**

1. An avionic control system for an aerodynamic vehicle, comprising:

a flight control surface divided into a plurality of flight control surface segments, each control surface segment

being independently mounted for angular movement about a hinge axis;

a power actuator for each said control surface segment, connected adjacent to each said control surface segment for independent angular movement thereof;

a manually operable controller for generating a first signal related to direction and magnitude of displacement of said controller;

air data sensing means including an airspeed sensing transducer for generating a second signal;

a first remote acquisition and control unit (1st RACU) having a signal conditioning circuit for receiving said first and second signals and converting them to digital format;

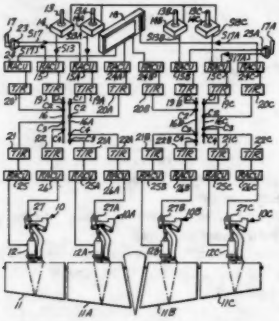
a first transmitter/receiver data bus terminal (1st T/R) being of the digital autonomous terminal access communication (DATAC) type for receiving said first and second digital format signals from said first remote acquisition and control unit;

a data bus being of the current-mode type;

a first data bus coupler for putting said first and second signals from said first data bus terminal onto said data bus;

a second transmitter/receiver data bus terminal (2nd T/R) for each said control surface segment, being also of the digital autonomous terminal access communication (DATAC) type;

a second date bus coupler for each said control surface segment, for transferring said first signal from said data bus to said second data bus terminal (2nd T/R);



a second remote acquisition and control unit (2nd RACU) for each said control surface segment, for receiving said first signal from said second data bus terminal (2nd T/R);

said second remote acquisition and control unit (2nd RACU) located adjacent to said power actuator for each said control surface segment, and transmitting said first signal to said power actuator for controlling angular movement of said control surface segment;

a gain control power module for each said control surface segment, situated in the mechanical linkage path between said power actuator and said control surface segment for independently changing the angular displacement range of said individual control surface segment relative to the movement of said power actuator;

a third transmitter/receiver data bus terminal (3rd T/R) for each said control surface segment, being also of the digital autonomous terminal access communication (DATAC) type;

a third data bus coupler for each said control surface segment, for transferring said second signal from sAid data bus to said third data bus terminal (3rd T/R); and,

a third remote acquisition and control unit (3rd RACU) for each said control surface segment, located adjacent to said gain control power module for receiving said second signal from said third data bus terminal and transmitting said second signal to said gain control power module for decreasing the angular displacement range of said control surface segment relative to the movement of said power actuator as the speed of said vehicle increases.

4,649,485

APPARATUS FOR CONTROLLING CONTINUOUSLY VARIABLE TRANSMISSION

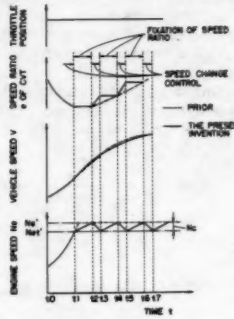
Akinori Osanai; Takao Niwa, and Takeshi Gono, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 10, 1984, Ser. No. 629,466

Claims priority, application Japan, Aug. 22, 1983, 58-151731

Int. Cl.[4] F16H *9/18*

U.S. Cl. 364—424.1 **8 Claims**



1. An apparatus for controlling a continuously variable transmission (CVT) wherein an actual engine speed Ne is equalized to a desired engine speed Ne', which is determined in accordance with at least one parameter said apparatus comprising:

a means for providing a positive constant value to Nc,

a means for substantially fixing the speed ratio of the CVT for a period of time starting when Ne changes from $Ne<Ne'-Nc$ to $Ne'-Nc \leqq Ne<Ne'$, and continuing until $Ne \geqq Ne'$,

a feedback control means for providing $Ne'-Nc$ as a temporary desired engine value for a period of time starting when Ne changes from $Ne \geqq Ne'$ to $Ne'-Nc \leqq Ne<Ne'$, and continuing until $Ne<Ne'-Nc$, and

a means for changing the speed ratio e of the CVT such that the actual engine speed Ne is equalized to the temporary engine speed $Ne'-Nc$ during said period of time,

wherein one of said parameters which determine the desired engine speed is the throttle position.

4,649,486

CONTROL METHOD FOR CONTINUOUSLY VARIABLE TRANSMISSION OR THE LIKE

Katsunori Oshiage, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 13, 1983, Ser. No. 561,034

Claims priority, application Japan, Dec. 17, 1982, 57-220091; Dec. 28, 1982, 57-227374

Int. Cl.[4] B60K *41/12*

U.S. Cl. 364—424.1 **15 Claims**

1. In a method of controlling a transmission the steps comprising:

(a) producing a signal indicative of the difference between a first value indicative of a desired gear ratio and a second value indicative of the actual gear ratio;

(b) differentiating said signal;

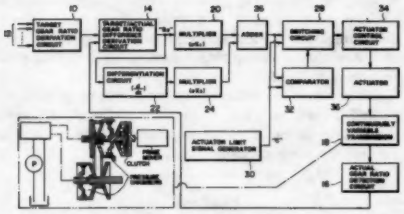
(c) adding the signal produced in step (a) to the differential thereof produced in step (b); and

(d) limiting the maximum value of the addition performed in step (c).

5. In a transmission:

first means for producing a signal indicative of the difference between a first value indicative of a desired gear ratio and a second value indicative of the actual gear ratio;

second means for differentiating said signal;



third means for adding the signal produced by said first means to the differential thereof produced by said second means; and

fourth means for limiting the maximum value of the addition performed by said third means.

4,649,487

METHOD AND APPARATUS FOR CONTROLLING CONTINUOUSLY VARIABLE TRANSMISSION FOR VEHICLE

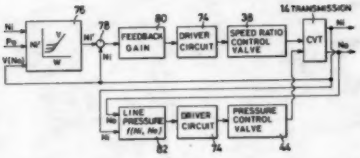
Akinori Osanai; Takeshi Gono, and Takao Niwa, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 24, 1984, Ser. No. 613,728

Claims priority, application Japan, Jun. 6, 1983, 58-100486

Int. Cl.⁴ F16H *5/66, 11/06;* **B60K** *41/18*

U.S. Cl. 364—424.1 **13 Claims**



6. An apparatus for controlling a speed ratio of a continuously variable transmission for a vehicle wherein an engine is provided with an intake gas through an intake manifold connected to the engine, said transmission having an input shaft operatively connected to said engine and an output shaft operatatively connected to drive wheels of the vehicle, said apparatus comprising:

pressure sensor disposed in said intake manifold;

a first rotation sensor operable to sense a rotating speed of said input shaft, for detecting a rotating speed of said engine;

a second rotation sensor operable to sense a rotating speed of said output shaft, for detecting a running speed of the vehicle; and

a microcomputer including engine output determining means for determining a current actual output of said engine based on the detected rotating speed thereof and on the detected vacuum pressure in said intake manifold, said microcomputer further including memory means for storing a pedetermined relation among said target speed of the engine, said running speed of the vehicle and said actual output of the engine, said relation being predetermined for increasing said target speed of the engine with the detected running speed of the vehicle and for attaining required output of the engine with a minimum specific fuel consumption, said microcomputer further including means for determining said target speed of the engine according to the stored predetermined relation, and based on the detected running speed and the determined actual output of the enine, and means for controlling said speed ratio of the transmission such that the detected actual speed of the engine coincides with the detected target speed of the engine.

4,649,488

METHOD AND APPARATUS FOR CONTROLLING CONTINUOUSLY VARIABLE TRANSMISSION FOR VEHICLE

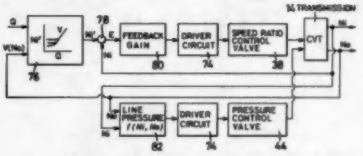
Akinori Osanai; Takeshi Gono, and Takao Niwa, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 24, 1984, Ser. No. 613,734

Claims priority, application Japan, Jun. 6, 1983, 58-100484

Int. Cl.⁴ F16H *5/66, 11/06;* **B60K** *41/18*

U.S. Cl. 364—424.1 **13 Claims**



6. An apparatus for controlling a speed ratio of a continuously variable transmission for a vehicle wherein an engine is provided with an intake gas through an intake manifold connected to the engine, said transmission having an input shaft operatively connected to said engine and an output shaft operatively connected to drive wheels of the vehicle, said apparatus comprising:

a first rotation sensor operable to sense a rotating speed of said input shaft, for detecting an actual speed of said engine;

a second rotation sensor operable to sense a rotating speed of said output shaft, for detecting a running speed of the vehicle;

an air flow meter disposed in said intake manifold to sense a flow of said intake gas through the intake manifold; and

a microcomputer including memory means for storing a predetermined relation among said target speed of the engine, said running speed of the vehicle and said flow of said intake gas, said relation being predetermined for increasing said target speed of the engine with the detected running speed of the vehicle and for attaining a required output of the engine with a minimum specific fuel consumption, said microcomputer further including means for determining said target speed of the engine according to the stored predetermined relation, and based on the detected running speed and the detected flow of the intake gas, and means for controlling said speed ratio of the transmission such that the detected actual speed of the engine coincides with the detected target speed of the engine.

4,649,489

METHOD FOR DATE-SETTING ELECTRONICALLY-CONTROLLED POSTAGE MACHINES

Horst Denzin, Berlin, Fed. Rep. of Germany, assignor to Francotyp GmbH, Berlin, Fed. Rep. of Germany

Filed Nov. 22, 1983, Ser. No. 554,218

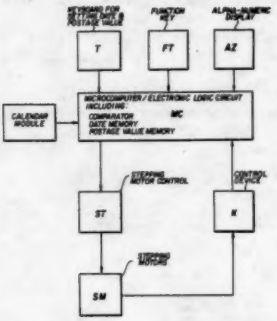
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1982, 3243696

Int. Cl.⁴ G07B *17/02;* **G06F** *3/02, 3/12;* **B41K** *3/08*

U.S. Cl. 364—464 **11 Claims**

1. Method for setting type wheels of a date printer in elec-

tronically-controlled postage machines, including print rollers, gear racks connected to the print rollers and the type wheels, stepping motors connected to the gear racks for activating the gear racks for setting selected print rollers and for setting the type wheels for printing postage values, an electronic logic circuit connected to the stepping motors for storing a date, a keyboard connected to the electronic logic circuit for setting postage values and for entering a date into the electronic logic



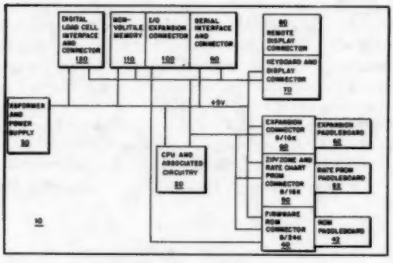
circuit, and a function key connected to the electronic logic circuit, the method which comprises setting a date by using the keyboard in conjunction with the function key, performing a comparison by the electronic logic circuit between a date already stored in the electronic logic circuit and the date on the keyboard and advancing the type wheels in case of a deviation between the entered and stored dates, repeating the comparison and advancing the date wheels until the comparison shows no deviation.

4,649,490

SCALE WITH PROCESSOR CONTROLLED POWER SWITCHING

Flavio Manduley, Woodbury, and Edwin G. Grisgraber, Huntington, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 20, 1984, Ser. No. 684,410
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—466 **13 Claims**



1. A postal scale comprising:

(a) processing means for controlling the operation of said scale and for computing appropriate postage values in accordance with the weight of an item to be mailed and postal information entered by an operator, said processing means being controlled by a stored program;

(b) input means for transmission by said operator of said postal information to said processing means;

(c) weighing means for determining the weight of said item to be mailed, for converting said weight to digital form, and for transmitting said digitized weight to said processing means;

(d) a power supply for supplying power to said processing means, said input means and said weighing means;

(e) power switching means, responsive to said processing means, for selectively connecting said input means and said weighing means to said power supply as necessary to determine said weight and compute said postage values and then disconnecting said means, so as to reduce power requirements; and,

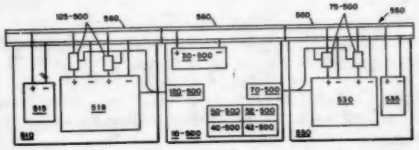
(f) sensing means for detecting the presence of an item to be mailed on said weighing means and, in response, initiate the determination of the appropriate postage for said item by said processing means.

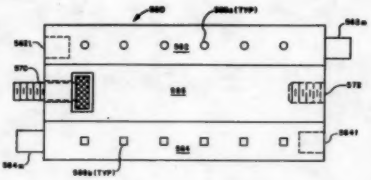
4,649,491

MODULAR BATTERY POWERED BUSINESS SYSTEMS

Flavio Manduley, Woodbury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 20, 1984, Ser. No. 684,409
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—464 **6 Claims**





1. A digital system comprising:

(a) a plurality of modular subsystems, at least one of said subsystems including a battery for supplying power to said system;

(b) connector means for providing signal interconnections between said subsystems;

(c) a common, substantially rigid, extended power distribution bus to which each of said subsystems is mechanically and electrically connected so that the power from said battery is shared by each of said subsystems and said subsystems are mechanically interconnected to form a single unit, said bus further comprising a plurality of modular sections each section comprising;

(c1) a pair of extended conductors for providing positive and negative buses;

(c2) a rigid, insulating element fixed to each of said conductors for holding said conductors in a spaced, parallel relationship;

(c3) means for providing mechanical and electrical connection between said conductors and said subsystems; and

(c4) a pair of connecting means, one at each end of said each section for mechanically and electrically connecting said each section to adjacent similar sections to form said power distribution bus.

5. A modular section for forming a substantially rigid, extended power distribution bus for mechanically and electrically interconnecting modular subsystems, comprising:

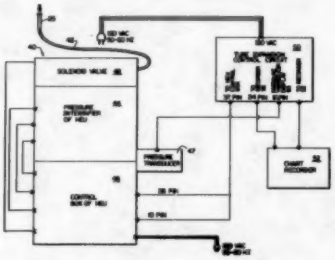
(a) a pair of extended conductors for providing positive and negative conductors;
(b) a rigid insulating element fixed to each of said conductors for holding each of said conductors in a spaced parallel relationsip;
(c) means for providing mechanical and electrical connections between said conductors and said subsystems; and
(d) a pair of connecting means one at each end of said section for substantially rigidly mechanically and electrically connecting said sections to form said bus.

4,649,492

TUBE EXPANSION PROCESS

Susanta Sinha, Penn Township, Lancaster County, Pa.; Philip S. Brown, Brandon; Douglas G. Harman, Pensacola Beach, both of Fla.; Harold T. Keller, Baldwin Borough, Pa.; David F. Olechovsky, North Huntingdon, Pa., and Wenche W. Cheng, Monroeville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 30, 1983, Ser. No. 567,102
The portion of the term of this patent subsequent to Mar. 10, 2004, has been disclaimed.
Int. Cl.[4] G06F *15/46;* B23P *15/26*
U.S. Cl. 364—472 **42 Claims**



1. A process for expanding a portion of a plastically deformable conduit surrounded by a structure in order to reduce the distance between said conduit portion and said structure, comprising the steps of:
(a) applying a radially expansive pressure within said conduit which generally increases over time to plastically expand said conduit portion;
(b) monitoring the value of the radially expansive pressure along the curve defined by pressure over time;
(c) determining a final value for said radially expansive pressure on the basis of the value of said expansive pressure at an inflection point in said curve, and
(d) bringing said radially expansive pressure to said final value, and removing said pressure.

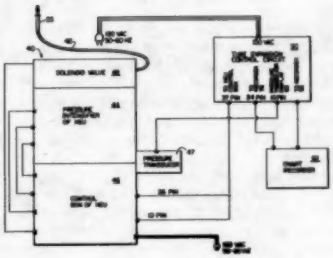
4,649,493

TUBE EXPANSION APPARATUS

Raymond P. Castner, Monroeville; David F. Olechovsky, North Huntingdon, both of Pa.; Philip S. Brown, Brandon, Fla.; Susanta Sinha, Penn Township, Westmoreland County, Pa.; Harold T. Keller, Baldwin Borough, Pa., and Wenche W. Cheng, Monroeville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 30, 1983, Ser. No. 567,104
The portion of the term of this patent subsequent to Mar. 10, 2004, has been disclaimed.
Int. Cl.[4] G06F *15/46;* B23P *15/26*
U.S. Cl. 364—472 **27 Claims**

1. An apparatus for reducing the clearance between a plastically deformable conduit and a structure surrounding a section of said conduit by plastically expanding said conduit, comprising:
(a) an expansive force means for generating a radially expansive pressure within said section of said conduit which increases as a function of time, whereby said conduit section is expanded into contact with said surrounding structure, and
(b) a control means including a pressure sensing means for sensing the value of the pressure generated within the conduit, and a computer circuit having a timing circuit which is electrically connected to the pressure sensing means for detecting inflection points in the function defined by changes in pressure over time, and for computing the value of a final pressure within the conduit which will permanently deform the conduit into a selected proximity with respect to the surrounding structure in accordance with a function wherein the value of said final pressure is dependent upon the pressure within said conduit associated with one of said inflection points.

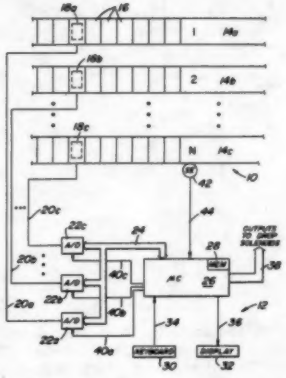


4,649,494

METHOD FOR MAINTAINING ZERO CALIBRATION VALUES IN ARTICLE SORTING MACHINE

Robin R. Rosas, Three Rivers, Calif., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jun. 29, 1984, Ser. No. 625,935
Int. Cl.[4] G01G *19/04*
U.S. Cl. 364—478 **9 Claims**



1. A method for updating values representative of average tare stored in a memory section of an electronic controller for an article sorting machine of the type having a plurality of cups connected in a continuous belt for carrying articles to be sorted according to their weight, the cups being transportable over an electronic weight station which provides a weight signal for each cup transported thereover, the weight signal having a value representative of the weight of the cup over the weight station, and if the cup is carrying an article, the weight of the cup and the article, the method comprising the steps of:

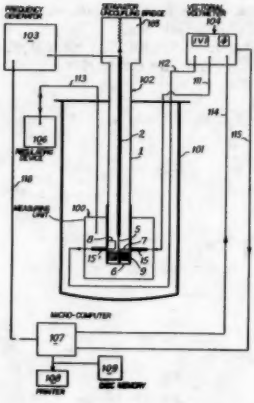
(a) providing via a user operable data entry means data representative of at least one threshold value;
(b) providing an initial value representative of the average tare and storing the initial value in a selected memory location of the memory section;
(c) obtaining the weight signal from the weight station each time a cup is transported thereover;
(d) retrieving the initial value representative of average tare and subtracting the initial value from the value of the weight signal, the resulting value defining an article weight value;
(e) comparing the article weight value to the threshold value and determining whether the cup is carrying an article based upon the result of the comparison;
(f) maintaining a running sum of the values of the weight signals for the cups determined not to be carrying articles;
(g) maintaining an empty cup count representative of the number of cups determined not be be carrying articles;
(h) dividing the running sum by the empty cup count, the resulting value defining an updated average tare;
(i) replacing the initial value stored in the selected memory location with the updated average tare; and
(j) resetting the running sum and the empty cup count only after the empty cup count has reached a preselected value.

4,649,495

PROCESS AND DEVICE FOR MEASURING THE INITIAL PERMEABILITY OF FERRIMAGNETIC MATERIALS OVER A WIDE FREQUENCY BAND

Vladimir Cagan, Paris, and Marcèl Guyot, Epernon, both of France, assignors to Centre National de la Recherche Scientifique (CNRS), Paris, France

Filed Aug. 1, 1984, Ser. No. 636,827
Claims priority, application France, Aug. 8, 1983, 83 13042
Int. Cl.[4] G01N *27/72*; G01R *33/12*; G06F *15/32*
U.S. Cl. 364—481 **12 Claims**



4. A device for measuring the initial permeability of ferrimagnetic materials in a frequency range between a few MHz and a few GHz, as a function of temperature, comprising a measuring unit located inside a thermostatically-controlled enclosure and connected (a) to a principal coaxial line fed from a frequency generator, said principal coaxial line having a central conductor and an outside conductor, (b) to first and second secondary coaxial cable which are connected to a vectorial voltmeter, said first secondary coaxial cable having a first central conductor and a first outside conductor and said second secondary coaxial cable having a second central conductor and a second outside conductor and (c) to connecting conductors which are connected to a temperature measuring and regulation circuit for measuring and regulating the temperature of the measuring unit; wherein the measuring unit comprises two semi-cylindrical massive metal half-shells, which are located at the end of the principal coaxial line and are in contact with the outside conductor of the principal coaxial line, or an extension of said outside conductor; means are provided to short circuit the end of the principal coaxial line in the measuring unit; a detachable measuring loop placed in the unit near the short circuiting means is connected to the first central conductor of said first secondary coaxial connecting cable; a reference loop placed in said unit near the detachable measuring loop and having dimensions close to those of the measuring loop is connected to the second central conductor of said second secondary coaxial connecting cable; and said detachable measuring loop is formed so that it can surround a toroidal sample of ferrimagnetic material to be analyzed introduced into said unit coaxially to the principal coaxial line near said short circuiting means while being in contact exclusively with the outside conductor of said principal coaxial line.

4,649,496

SPECTRUM ANALYZER WITH IMPROVED DATA ANALYSIS AND DISPLAY FEATURES

Gregory A. Anderson; Paul M. Eason, and Lynn M. Wheelwright, all of Santa Rosa, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 16, 1984, Ser. No. 580,992
Int. Cl.[4] G01R *23/00, 23/16*; G06F *15/40*
U.S. Cl. 364—485 **4 Claims**

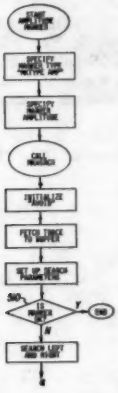
2. A method of placing a marker on a signal trace of a stored digital representation of a measured signal produced as a result of a swept frequency measurement displayed on a swept frequency measurement apparatus having a control panel, comprising the steps of:

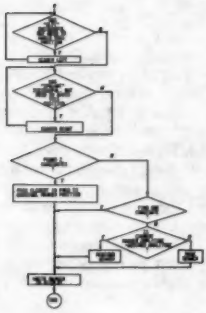
setting a marker amplitude level on the control panel at which the marker is to be placed on the signal trace;

providing a marker amplitude level signal corresponding to the amplitude set on the control panel;

comparing the marker amplitude level signal with the amplitude of the stored digital representation of the measured signal by the swept frequency measurement apparatus to

automatically locate the position on the signal trace closest to the marker amplitude level; and





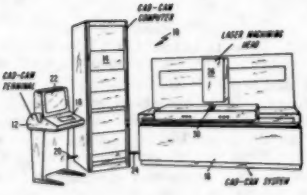
placing a marker on the signal trace at the position located by the swept frequency measurement apparatus.

4,649,497

COMPUTER-PRODUCED CIRCUIT BOARD

Alden J. Carlson, Bothell, and Kasi S. Bhaskar, Seattle, both of Wash., assignors to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Jun. 3, 1983, Ser. No. 500,816
Int. Cl.[4] G06F *15/60*; G01D *9/42*
U.S. Cl. 364—491 **12 Claims**



1. A method a manufacturing a circuit board using a computer system, comprising:

(a) designing a circuit configuration of the circuit board on a computer aided design system;

(b) determining a desired circuit configuration outline on said computer aided design system from said circuit configuration and providing the desired circuit configuration outline to a computer aided machining system; and

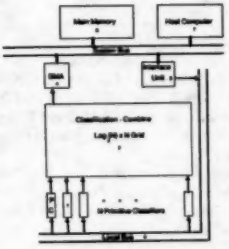
(c) removing conductive material along the outline to leave conductive material formed adjacent the removal material as the circuit configuration under the guidance of said computer aided machining system from a conductive material covered, nonconductive board.

4,649,498

COMPUTER SYSTEMS FOR CURVE-SOLID CLASSIFICATION AND SOLID MODELING

Gershon Kedem, Rochester, and John L. Ellis, Rush, both of N.Y., assignors to The University of Rochester, Rochester, N.Y.

Filed May 8, 1984, Ser. No. 608,295
Int. Cl.[4] G09G *1/06*; G06F *15/62*
U.S. Cl. 364—518 **14 Claims**



The Curve-Solid Classification System

1. A system for the characterization of plural dimensional objects, including representing images of such objects, from the intersections of curves with primitive solids and from set operations on said intersections from which said objects can be constructed which comprises a plurality of primitive classification means for computing the intersections of a plurality of curves with said primitive solids, a plurality of means for computing classification combinations arranged with said primitive classification means in a binary tree which defines the object by constructive solid geometry, said classification combination computing means each corresponding to a different node of said tree and having means for computing a set operation for its corresponding node.

4,649,499

TOUCHSCREEN TWO-DIMENSIONAL EMULATION OF THREE-DIMENSIONAL OBJECTS

Jimmy Sutton, Santa Clara; Wanda Shearer, Lafayette; Karlie J. Arkin, Santa Clara; Jeffrey A. Spoelstra, San Jose; Steven M. Weiss, Sunnyvale; Sherry L. Ramsey, Los Altos; Kyle Hurlbut, San Jose; W. Bruce Culbertson, Palo Alto, and Robert R. Burns, Santa Clara, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

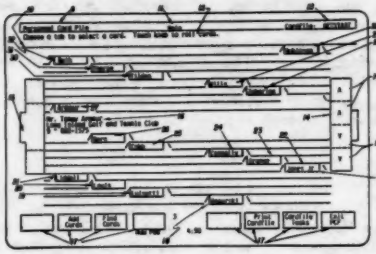
Filed Mar. 7, 1984, Ser. No. 586,954
Int. Cl.[4] G08C *9/00*; G06F *15/62*
U.S. Cl. 364—518 **9 Claims**

1. An apparatus for providing a two dimensional representation of a three dimensional object and allowing a user to interact with the two dimensional representation, the apparatus comprising:

a computer with a video screen;

computer programming means coupled to the computer for providing a two-dimensional reproduction of the three-dimensional object on the computer video screen; and,

touchscreen interaction means coupled to the computer for allowing an operator to interact with the computer programming means by touching the two-dimensional reproduction wherein such interaction is substantially similar to the way the user would interact with the three dimensional object.



4,649,500

COLLECTION METHOD OF DATA ON FEED AMOUNT OF PRINTING INK AND SYSTEM THEREFOR

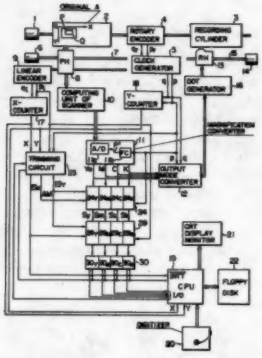
Mitsuhiko Yamada, Kyoto, and Hideaki Kitamura, Osaka, both of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Jul. 24, 1985, Ser. No. 758,479

Claims priority, application Japan, Oct. 26, 1984, 59-223900

Int. Cl.[4] G06F *15/70*; H04N *1/22, 1/46*; B41M *1/14*

U.S. Cl. 364—518 **6 Claims**



6. A method for collecting and utilizing data relating to the amount of ink to be fed in a color separation printing process, comprising the step of:

scanning the original pictures and obtaining color separation signals for the preparation of color separated printing plates;

preparing color separated printing plates;

utilizing said color separation signals to provide signals indicating the amount of ink of each color to be fed to each predetermined area for each color of the color printing process;

storing the ink feed signals for each color for each predetermined area in computer memory, along with the two dimensional addresses associated with the ink feed signals for each color and each area of the final intended picture;

retrieving said ink feed signals from computer memory at the time of printing, and selectively controlling ink flow to selected areas of the printing plates for each color in accordance with said ink feed signals.

4,649,501

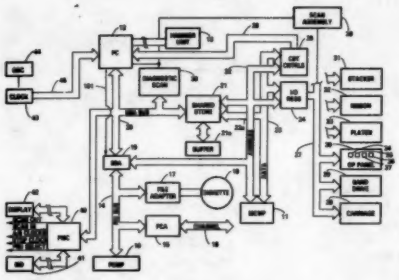
BAND PRINTER CONTROL SYSTEM ARCHITECTURE

Robert D. Bloom, Montrose, Pa.; James E. Carrington, Vestal, N.Y.; Richard A. Ide, Sonoita, Ariz.; Patrick J. Traglia, Endwell, and Gerald R. Westcott, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 29, 1985, Ser. No. 696,212

Int. Cl.[4] G01F *15/40*

U.S. Cl. 364—519 **17 Claims**



1. A line printer including means for moving a paper web along a defined path, means for moving an endless type set at constant speed along a print line across said paper web, means for moving an ink ribbon along a defined path between said type carrier and said paper, a hammer bank comprised of a plurality of print hammers arranged in a row parallel with said print line each hammer being operable for recording lines of data from said type set on said paper web, and a control system responsive to a source of externally supplied data for operating said means for moving said paper web, said endless type set, said ink ribbon and for operating said print hammers in timed relation with the constant speed of said type set whereby lines of data are printed on said paper web comprising:

read/write memory means including print control and mechanical control buffers;

first processor means coupled to said read/write memory means including means responsive to data supplied by said external source for supplying print data to said print control buffers for operating said print hammers and mechanical control data to said mechanical control buffer for controlling said means for moving said paper web, said ink ribbon and for moving said endless type set at said constant speed; and second processor means coupled to said mechanical control buffer and operable in response to mechanical control data stored in said mechanical control buffer by said first processor means for controlling the operation of said means for moving said paper web, said ink ribbon, and said endless type set.

4,649,502

PROCESS AND APPARATUS FOR EVALUATING PRINTING QUALITY AND FOR REGULATING THE INK FEED CONTROLS IN AN OFFSET PRINTING MACHINE

Guido Keller, Zärich; Andreas Spiess, Kloten; Hans Ott, and Rolf Boegli, both of Regensdorf, all of Switzerland, assignors to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Oct. 29, 1984, Ser. No. 665,974

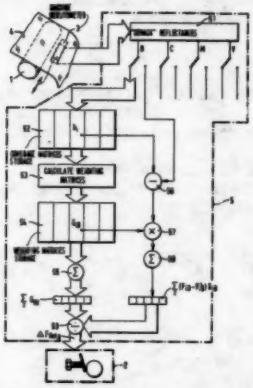
Claims priority, application Switzerland, Nov. 4, 1983, 5965/83; Dec. 27, 1983, 6926/83

Int. Cl.[4] G01N *21/88*; G06M *5/00*; B41M *1/00*

U.S. Cl. 364—519 **42 Claims**

1. A process for evaluating printing quality and for regulat-

ing ink feed controls in an offset printing machine by photoelectric measurement, by image elements, of both the printed products and a reference, in which the comparison, by image elements, of the printed products to the reference is the basis for the determination of a quality measure and of setting values for the ink feed control elements, comprising the steps of: dividing a reference for the individual printing colors into a plurality of image elements, and for each image element, determining the reference surface coverage for the individual printing colors, the reference being in the form of at least one of a printing plate upon which the printing process is based, and a printed product which has previously been determined to be satisfactory, assigning to each image element, for each printing



color, a weighting factor indicating a measure of the assurance with which the prevailing surface coverage may be determined, dividing the printed product into image elements in the same manner as is the reference, measuring the reflectance for each printed product image element, calculating the actual surface coverage for each of the printing colors from the respective reflectances, determining, for each image element and the individual printing colors, deviations of the actual surface coverages from the reference coverages, weighting the deviations with the assigned weighting factors, and determining at least one of the quality measure, and the setting values for the ink feed control elements, from said weighted deviations.

4,649,503

INSPECTION APPARATUS FOR INSPECTING ARTICLES MOVING ON A CONVEYOR

Rene Keller, Wettswil, Switzerland, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Jan. 16, 1984, Ser. No. 571,265

Claims priority, application United Kingdom, Jan. 18, 1983, 8301297

Int. Cl.[4] G06F *15/20*; G01N *21/16*

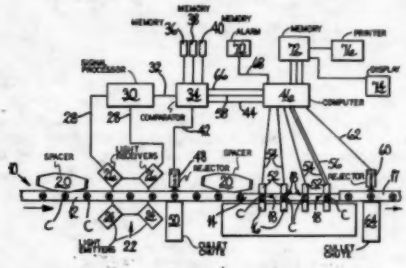
U.S. Cl. 364—552 **4 Claims**

1. In a container inspection system including a conveyor means for sequentially transporting a plurality of containers, each of said containers being formed in one of a plurality of molds and having a code indicating the mold in which it was formed, code reading means located along the path of said conveyor means for reading said codes on said containers, and inspection apparatus located along the path of said conveyor means for inspecting said containers to determine a characteristic other than lean of said containers, the improvement comprising:

lean detection means located along the path of said conveyor means upstream of said inspection apparatus and said code reading means for measuring the amounts of lean exhibited by the containers being transported by said conveyor means,

means for comparing the amounts of lean measured by said lean detection means to first and second standards and generating a first reject signal when the amount of lean exceeds said first standard and a second reject signal when the amount of lean exceeds said second standard, said first standard representing a greater amount of lean than said second standard and containers exhibiting said greater amount of lean posing a substantial threat of jamming said inspection apparatus while containers exhibiting lesser amounts of lean posing relatively little threat of jamming said inspection apparatus but being unacceptable for their intended purpose,

means operatively coupled to said code reading means and the comparing means for recording the code of the mold



which produced each container exhibiting said lesser amount of lean,

first reject means located adjacent to said conveyor means downstream of said lean detection means and upstream of said inspection apparatus and said code reader means for rejecting containers from said conveyor means in response to said first reject signals so that containers exhibiting said greater amount of lean are rejected before reaching said inspection apparatus and containers exhibiting said lesser amounts of lean pass by said first reject means to said inspection apparatus and code reading means, and

second reject means located adjacent to said conveyor means downstream of said inspection apparatus and said code reading means and responsive to said second reject signals for rejecting the containers exhibiting said lesser amounts of lean after said code reading means reads their codes.

4,649,504

OPTICAL POSITION AND ORIENTATION MEASUREMENT TECHNIQUES

Nicholas Krouglicof, Montreal West; Gordon M. McKinnon, Montreal, and Jaroslav Svoboda, Hudson Heights, all of Canada, assignors to CAE Electronics, Ltd., Montreal, Canada

Filed May 22, 1984, Ser. No. 613,063

Int. Cl.[4] G06G *7/48*; G09G *3/02*; G01B *11/26*

U.S. Cl. 364—559 **8 Claims**

1. A non-contact sensing system for monitoring the position and orientation of a rigid body in space wherein at least three distinct point light sources are mounted on said body for movement therewith;

said system comprising:

at least two position sensor heads fixedly mounted within detection range of light from all of said light sources, said position sensor heads being directed at said light sources;

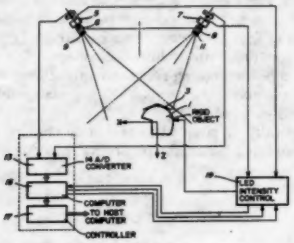
wherein each position sensor head includes a position sensitive detector;

means for turning said light sources on one at a time and in a sequential arrangement;

processor means;

said position sensitive detector outputs being connected to the input of said processor means;

said processor means computing the position in three-dimensional space of a turned on light source with data concerning said turned on light source provided simultaneously by both position sensitive detectors;



said processor means also computing the position of said object in all six degrees of freedom using the three-dimensional positional data of all three light sources;

said processor means further selecting which light source is to be turned on and driving said means for turning said light source on, whereby said computer has data concerning which light source is turned on at any time.

4,649,505

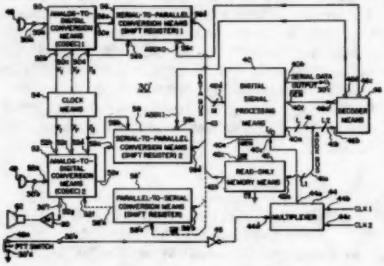
TWO-INPUT CROSSTALK-RESISTANT ADAPTIVE NOISE CANCELLER

Richard L. Zinser, Jr.; Seth D. Silverstein, and Steven R. Koch, all of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 2, 1984, Ser. No. 627,251

Int. Cl.[4] H03F *1/266;* **H03K** *5/159;* **G06F** *7/38;* **H04B** *3/20*

U.S. Cl. 379—411 **25 Claims**



1. An adaptive noise canceller, comprising:

first means for receiving a primary signal having a first desired portion and a second undesired noise portion;

second means for receiving, during each of a successive sequence of time intervals (n); a reference signal (r(n)) having a first crosstalk portion with a time-amplitude characteristic similar to that of said primary signal first portion and a second noise portion with a time-amplitude characteristic similar to that of said primary signal second portion;

first summer means for subtracting from said primary signal, received from said first means, a noise reference signal (w(n)) to provide an output signal (S(n)) having said primary signal first portion and a second undesirable noise portion which is of reduced amplitude with respect to the amplitude of the primary signal second portion;

first adaptive filter means having a reference input receiving said reference signal (r(n)) from said second means, a first error-control input receiving said output signal (S(n)), and a second error-control input receiving an estimation signal ($S_1(n)$), for providing said noise reference signal (w(n)) responsive to a predetermined response pattern dependent upon the conditions of all of said signals then present at said reference input, said first error-control input and said second error-control input;

second adaptive filter means having a reference input receiving said output signal (S(n)) and a single error-control input receiving an auxiliary signal ($w_1(n)$) for providing said estimation signal ($S_1(n)$) to said first adaptive filter means second error-control input; and

second summer means for subtracting said estimation signal ($S_1(n)$) from said reference signal (r(n)) to provide said auxiliary signal ($W_1(n)$) to said second adapter filter means signal error-control input.

4,649,506

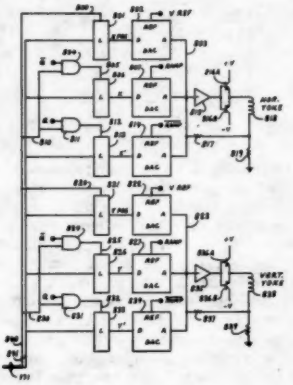
VECTOR GENERATOR USING INTERPOLATIVE ANALOG CIRCUITS

Raymond C. Van den Heuvel, 18618 Celtic St., Northridge, Calif. 91326

Filed Mar. 12, 1984, Ser. No. 588,351

Int. Cl.[4] G06F *3/14;* **G09G** *1/00;* **H01J** *29/70*

U.S. Cl. 364—607 **1 Claim**



1. A system wherein CRT display means is of an alphanumeric graphic type, also known as a vector generator, and comprising the following combination:

an array of eight identical electronic circuit means for latching and storing digital information consisting of the X and Y coordinates of the position of an object, the X and Y coordinates of the end point of a given vector or straight line segment, the slew rate of said vector and the color or intensity of said vector, there being two such means for the X coordinates of said end point and two for the Y coordinate of said end point, and one such means each for the X position, the Y position, the slew rate and color or intensity;

an arry of seven identical multiplying digital to analog converter means, one for each latching and storing means as above except for the color or intensity information;

means for steering said X and Y coordinate of end point information into one pair of said X and Y latching and storing means when generating odd-numbered vectors and into the remaining pair when generating even-numbered vectors, in such a way that coordinate information is always loaded into the X and Y latching and storing means connected to said multiplying digital to analog

converter means whose reference voltage happens to be zero or minimum;

means for generating two complementary, linearly increasing or decreasing reference voltages to be used as references for said four multiplying digital to analog converter means whose digital input is an X or Y coordinate of end point as above;

means for controlling the slew rate of said reference voltages in response to a digital code representative of slew rate as above;

means for generating cathode drive signals for a CRT upon input of a digital code representative of color or intensity as above, there being generated three cathode signals in the case of a color CRT, and only one cathode signal in the case of a monochrome CRT;

means for controlling and adjusting the range of the reference voltages of said four multiplying digital to analog converter means used for the generation of X and Y position voltages in the generation of individual vectors as above;

means for turning "on" the video circuits of said CRT and controlling the time interval during which video is turned "on" to coincide with the time interval during which said reference voltages are in transition between a maximum and a minimum value that can be changed or adjusted for optimum "closure" or angle transition between interconnected vectors;

means for summing analog signals generated at the output of said digital to analog conversion means pertaining to the X axis and converting them into an equivalent horizontal deflection current in the horizontal deflection yoke of said color or monochrome CRT;

identical summing and deflection means for the Y axis or vertical deflection yoke of said color or monochrome CRT.

4,649,507

SEGMENTED TRANSVERSAL FILTER

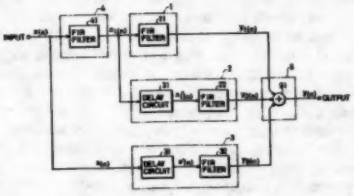
Masao Inaba; Hiroshi Takahashi, both of Tokyo; Kazuhiko Nosaka, and Takahiko Hattori, both of Osaka, all of Japan, assignors to NEC Corporation, Tokyo and New Nippon Electric Co., Ltd., Osaka, both of, Japan

Filed Sep. 12, 1983, Ser. No. 531,400

Claims priority, application Japan, Sep. 20, 1982, 57-163726

Int. Cl.⁴ G06F *15/31*; H03H *15/00*

U.S. Cl. 364—724 **4 Claims**



1. A segmented transversal filter, comprising:

a lowpass filter for filtering a signal;

a first transversal filter connected to the output of said lowpass filter, said first filter having coefficients decimated at a predetermined frequency period from one end segment of a transversal filter coefficient sequence, said coefficients being adjusted to compensate the energy of the decimated coefficients;

a second transversal filter connected to the output of said lowpass filter, said second filter having coefficients decimated at said period from the other end segment of said sequence, said coefficients being adjusted to compensate for the energy of the decimated coefficients;

a third transversal filter receiving said signal, said third transversal filter having coefficients from a central segment of said sequence;

means for synchronizing the outputs of said first, second, and third filters; and

an adder for adding the synchronized outputs of said first, second and third filters.

4,649,508

FLOATING-POINT ARITHMETIC OPERATION SYSTEM

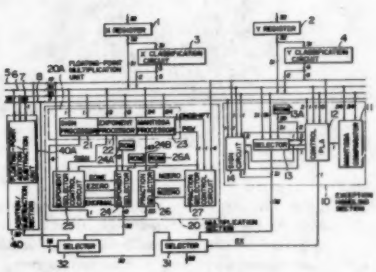
Akira Kanuma, Zushi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Oct. 27, 1983, Ser. No. 546,040

Claims priority, application Japan, Oct. 29, 1982, 57/190303

Int. Cl.⁴ G06F *7/38*

U.S. Cl. 364—748 **7 Claims**



1. A floating-point arithmetic operation system for performing an arithmetic operation on two given operands X, Y and providing the result Z of the arithmetic operation, comprising:

an X classification circuit receiving at least part of the bits representing the operand X to classify the operand X based only on said received operand X bits and producing at least one corresponding X class signal indicative of the result of the classification;

a Y classification circuit receiving at least part of the bits representing the operand Y to classify the operand Y based only on said received operand Y bits and producing at least one corresponding Y class signal indicative of the result of the classification; and

adopting means responsive to the X class signal, and Y class signal for adopting at least part of the bits of the corresponding operand X, at least part of the bits of the corresponding operand Y or a predetermined set of bits, as at least part of the result of Z of the operation when the X class signal and the Y class signal are in predetermined categories.

4,649,509

SURFACE ACOUSTIC WAVE CONVOLVER ARRANGEMENT WITH CLOSELY SPACED IMPEDANCE MATCHED INPUT TRANSDUCERS

Helge Engan, Trondheim, Norway, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 2, 1984, Ser. No. 636,928

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1983, 3330034

Int. Cl.⁴ G06G *7/12*; H01L *41/04*; H03H *9/00*

U.S. Cl. 364—821 **6 Claims**

1. A surface acoustic wave convolver arrangement, comprising:

a substrate;

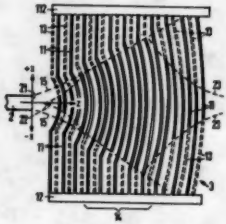
an integration electrode on the substrate acting as a waveguide;

first and second interdigital input transducers which, along with the integration electrode, are aligned along a z-axis corresponding to a wave propagation direction in the

convolver arrangement, said interdigital input transducers being respectively arranged at opposite ends of the integration electrode and having their ends opposite the respective ends of the integration electrode;

the input transducers being dispersive transducers and at their ends opposite the integration electrode end having an aperture which is comparably large compared with an aperture of the integration electrode at the respective end;

at least one of the interdigital input transducers having a plurality of fingers wherein adjacent fingers are oppositely poled and wherein the fingers have concave portions deviating from a linear shape when viewed from the end adjacent the respective integration electrode end and



the concave portions of said curved fingers having a progression of curvature at least approximately corresponding to the form of a wavefront at the location of each of said respective fingers, said wavefront being associated with a given sonic wave proceeding from said end of the integration electrode towards said plurality of fingers; and

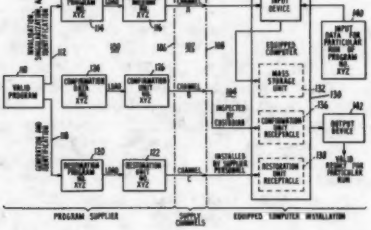
a primary section of said respective transducer being provided in which said respectively adjacent and oppositely poled curved finger portions overlap with one another, the extent of overlaps being dimensioned such that a substantially maximum receiving sensitivity is provided for said respective sonic wave proceeding from the end of the integration electrode.

4,649,510

METHODS AND APPARATUS FOR THE PROTECTION AND CONTROL OF COMPUTER PROGRAMS

Walter E. Schmidt, 604 W. 115th St., Apt. B, New York, N.Y. 10025

Filed Apr. 30, 1982, Ser. No. 373,668
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—900 **5 Claims**



1. The method of protecting and controlling a computer program, comprising the steps of:

systematically invalidating said computer program in accordance with a predetermined invalidation procedure;

making a recording of said systematically invalidated computer program on a storage device; and

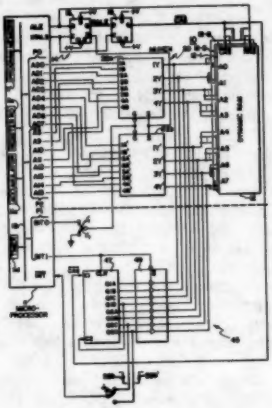
making a recording on another storage device of a restoration program for restoring said systematically invalidated computer program to its valid form.

4,649,511

DYNAMIC MEMORY CONTROLLER FOR SINGLE-CHIP MICROPROCESSOR

Michael Gduls, Knox, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 25, 1983, Ser. No. 516,620
Int. Cl.[4] G06F *12/00*
U.S. Cl. 364—900 **15 Claims**



1. In combination, dynamic memory means for storing one bit of each of a plurality of data words in each cell along one of a plurality of rows each containing a multiplicity of said cells, said dynamic memory means requiring periodic refreshment, within a maximum time interval, of at least one cell along each of said rows, and including a plurality N of address inputs for designating at least the row of said memory means to be addressed;

single-chip microprocessor means internally containing at least a cpu and an internal memory, for utilization of the data stored into said dynamic memory means, which is external to said microprocessor means, and including means for providing a periodic clock signal timing means for causing a refresh sequence for the external memory means to be initiated at a time not longer than the maximum time interval after a previous refreah sequence has been initiated; means for periodically providing a single external memory enable signal during each of a sequential multiplicity of operational cycles of said miroprocessor means; at least two output ports of N bit-lines each; and refresh-addressing means for presenting a refresh row designation data to at least one designated one of said output ports responsive to an initiation of a refresh sequence by said timing means; and

address means, activated directly and solely by said clock signal and said single external memory enable signal and responsive to said timing means initiating said refresh sequence, for sequentially addressing at least one cell along each of said plurality of memory means rows to refresh the information stored in all cells along that memory row having the cell then being addressed; said address means including: multiplexing means for selectively connecting each of the N bit-lines of said at least one designated one of the microprocessor means output ports to the associated one of the row-designating N inputs of said dynamic memory means, with the designation of the one output port of said microprocessor means then connected being responsive to different states of a selection signal;

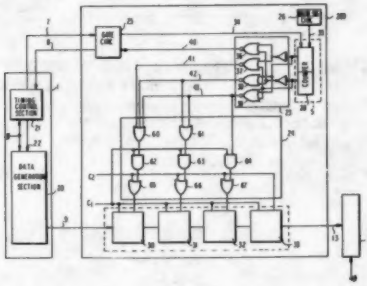
and logic means for providing the selection signal state responsive only to receipt of both said clock signal and said external memory enable signal from said microprocessor means, including a first flip-flop logic element having a clock input receiving said clock signal, a data input receiving said external memory enable signal, and an output providing said selection signal and having an output state determined by both the state of the data input signal and the occurrence of a first pulse of said clock signal exit clock input; and said memory means accepts thr ow designation data at said address inputs responsive to a row-address strobe signal generated by a change in said external memory enable signal prior to another pulse of said clock signal, occurring after said first clock signal pulse.

4,649,512

INTERFACE CIRCUIT HAVING A SHIFT REGISTER INSERTED BETWEEN A DATA TRANSMISSION UNIT AND A DATA RECEPTION UNIT

Tomoji Nukiyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 18, 1983, Ser. No. 514,902
Claims priority, application Japan, Jul. 16, 1982, 57-123876
Int. Cl.[4] G06F *3/00, 5/00*
U.S. Cl. 364—900 **5 Claims**



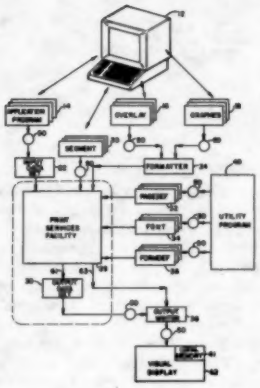
1. An interface circuit inserted between a data transmission unit and a data reception unit comprising a shift register having a plurality of serially coupled register stages, each register stage having a data input gate, a data storage means for storing data applied thereto through the data input gate, and a data output gate, first means for applying a write control signal in common to the data input gates of said register stages to turn on each data input gate, a second means for supplying a read control signal in common to the data output gates of said register stages to turn on each data output gate, a first bus coupled to the first register stage of said shift register for applying data from said data transmission unit to said input gate of said first register state, a second bus coupled to the last register stage of said shift register for deriving data stored in the last register, a counter counting the number of data applied to said first register stage through said first bus, and a control circuit coupled to said shift register and said counter and applying said write control signal to the output gate or gates of such register stage or stages that is selected by the output of said counter at the same time when said write control signal is applied to the data input gates of the register stages in common, whereby both the data input gate and the data output gate of the selected register stage or stages are simultaneously turned on by said write control signal to directly transfer a data through said selected register stage or stages.

4,649,513

APPARATUS AND METHOD FOR PROCESSING SYSTEM PRINTING DATA RECORDS ON A PAGE PRINTER

Mary S. Martin; Elizabeth McCord; Harley D. Puckett, Jr., all of Tucson, Ariz., and Thomas W. Scrutchin, Jr., Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 552,151, Nov. 15, 1983, abandoned. This application Sep. 13, 1984, Ser. No. 650,402
Int. Cl.[4] G06F *3/00*
U.S. Cl. 364—900 **3 Claims**



1. The method of preparing data streams comprising control signals and data representing signals from various devices for visual presentation on an image presentation device independently of any device-related characteristics embedded in said data streams including the steps of:

receiving said data stream;

processing said data stream including the steps of identifying from said data stream a plurality of records to be defined containing said data representing signals, specifying a plurality of fields within each of said identified records in which each field is given a field name, determining a starting position of each field being specified in the respective identified fields, specifying the length of each of the fields;

receiving separate from said data stream a plurality of sets of page-defining signals (each termed a PAGEDEF) including commands for a plurality of visual presentations of said received data representing signals;

selecting commands for visual presentation from said PAGEDEFs in accordance with said data stream;

formatting at least said received data representing signals of said records according to said selected commands of said PAGEDEFs into corresponding sets of visual presentation signals representing different pages of text as specified by said data stream independently of device characteristics;

receiving separate from the data stream a plurality of sets of form defining signals (each set termed FORMDEF), each FORMDEF including signals for mapping said pages of text to said image presentation device in accordance with predetermined characteristics of said image presentation device;

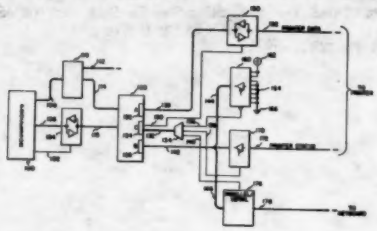
selecting in accordance with said data stream predetermined ones of said received FORMDEFs for use in corresponding visual presentations of said pages of text; and

visually presenting said received data representing signals on said image presentation device as information in accordance with said respective selected PAGEDEFs and FORMDEFs.

4,649,514
COMPUTER REVISION PORT

Michael F. Berger, Fort Worth, Tex., assignor to Tandy Corporation, Fort Worth, Tex.

Filed Nov. 30, 1983, Ser. No. 556,466
Int. Cl.[4] G06F 9/00, 11/00
U.S. Cl. 364—900 3 Claims



1. A computer system comprising,

a central processing unit having a control bus for transferring control signals between said central processing unit and various peripheral units and a data bus for transferring data between said central processing unit and the remainder of the computer system, said central processing unit being comprised of a plurality of circuit modules subject to circuit revisions and means for assembling operating systems software;

a programmable interface unit, said interface unit having a plurality of ports and being controlled by control signals on said control bus for transferring information between one of said ports and said data bus and for generating interface control signals at another of said ports when said central processing unit is assembling the operating system software;

a control decoder responsive to said interface control signals for generating an enable control signal,

a buffer circuit having a plurality of inputs and a plurality of outputs, said outputs being connected via said one of said ports of said programmable interface unit to said data bus in response to said enable control signal; and

means for generating at said inputs of said buffer circuit a code number corresponding to the revision level of said circuit modules;

said central processing unit including means for reading, during assembling of the operating system software, said code number from said data bus and for using said revision level information in said code number to load and link software routines which will operate properly with the revised circuit modules.

4,649,515
METHODS AND APPARATUS FOR SYSTEM FAULT DIAGNOSIS AND CONTROL

Timothy F. Thompson, Pittsburgh, and Robert M. Wojcik, Greensburg, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 605,704, Apr. 30, 1984, abandoned.
This application Jul. 1, 1986, Ser. No. 881,499
Int. Cl.[4] G06F 11/00
U.S. Cl. 364—900 34 Claims

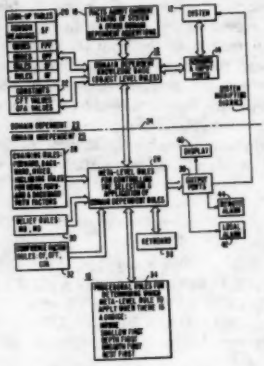
1. A method of diagnosing faults in a predetermined system, comprising the steps of: providing domain specific rules, including rules in evidence-hypothesis form, to build a knowledge base of assertions relative to the predetermined system,

maintaining said knowledge base free of information which makes inferences relative to the knowledge base,

providing data relative to the predetermined system,

providing inference rules, independent and distinct from said domain specific rules, which make belief propagating inferences in response to the data, by selecting and applying the domain specific rules,

propagating belief in the hypotheses of selected domain specific rules, in response to the data, by the step of inter-



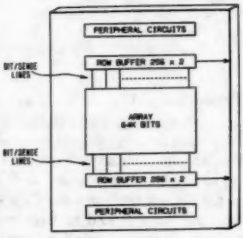
connecting the domain specific rules, under the control of the inference rules, into a rule network of hypothesis nodes interconnected by evidence,

and outputting information in response to the belief propagating step.

4,649,516
DYNAMIC ROW BUFFER CIRCUIT FOR DRAM

Paul W. Chung, San Jose, Calif.; Richard E. Matick, Peekskill, and Daniel T. Ling, Croton-on-Hudson, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jun. 1, 1984, Ser. No. 616,045
Int. Cl.[4] G06F 12/00, 13/38
U.S. Cl. 364—900 14 Claims



1. A dynamic row buffer circuit for a dynamic random access memory chip which enables the dynamic random access memory chip to be used for special function applications comprising a row buffer master register and a row buffer slave register, said row buffer master register comprising a plurality of first master circuits and a plurality of first slave circuits, said row buffer slave register comprising a plurality of second master circuits and a plurality of second slave circuits, said first master circuits being connected to bit sense amplifiers of the memory array and the outputs of said first master circuits being connected to the inputs of said first slave circuits to permit parallel data transfer from the memory array to said first master circuits and then to said first slave circuits, the inputs of said second master circuits being connected to the outputs of said first slave circuits and said second slave circuits being serially connected in an alternating sequence of second master and second slave circuits to permit parallel data transfer from said

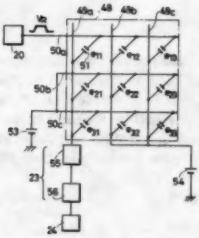
first slave circuits to said second master circuits and then serial data transfer in said row buffer slave register.

4,649,517

INFORMATION HOLDING DEVICE

Masaaki Kitazima, Hitachiohta; Hideaki Kawakami, Mito, and Yoshiharu Nagae, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 24, 1984, Ser. No. 583,356
Claims priority, application Japan, Feb. 25, 1983, 58-29450
Int. Cl.[4] G11C *13/04*
U.S. Cl. 365—108 20 Claims



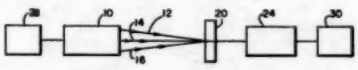
1. An information holding device comprising a pair of substrates having opposing surfaces, one substrate being formed with one electrode and the other substrate being formed with another electrode so that said one and said other electrodes are in opposition, a dielectric which is held between said pair of substrates, means to change a capacitance of the dielectric in the region between said one electrode and said other electrode where said one and other electrodes are in opposition, means to apply a voltage varying with time to the dielectric in said region of opposition, and means to detect principally a displacement current flowing through the dielectric in said region of opposition.

4,649,518

OPTICAL RECORDING DEVICE

Harry Sadjian, 207 Surrey Rd., Southampton, Pa. 18966

Filed Jul. 8, 1985, Ser. No. 752,915
Int. Cl.[4] G11C *11/42*
U.S. Cl. 365—119 55 Claims



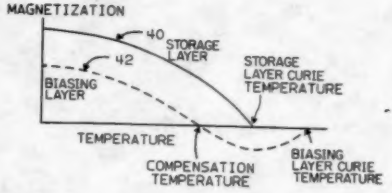
46. An optical recording device comprising a crystal selected from the group of alkali metal halides and alkali-earth halides and doped with an alkali metal dopant and negative ions to form a doped crystal having a negative ion light absorption band centered about a particular frequency and a color center light absorption band centered about another particular frequency, the doped crystal exhibiting two switching states with a first state having a predetermined light absorbance level in the negative ion band and a relatively low light absorbance level in the color center band with respect to the other state and a second state having a predetermined light absorbance level in the negative in the negative ion band and a relatively high light absorbance level in the color center band with respect to the first state and being repeatably switchable between the states by the irradiation of switching light of a selected intensity for a predetermined time period in the negative ion band to switch the state of the doped crystal from the first state to the second state and by the irradiation of switching light of a selected intensity for a predetermined time period in the color center band to switch the state of the doped crystal from the second state to the first state.

4,649,519

SELF BIASING THERMAL MAGNETO-OPTIC MEDIUM

Shu S. Sun, and Curt W. Laumann, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 30, 1985, Ser. No. 781,618
Int. Cl.[4] G11C *13/06*
U.S. Cl. 365—122 29 Claims



1. A thermally written magnetic data storage medium for retaining domains of desired magnetic field orientations representative of the data comprising:

data layer means for retaining the domains having desired magnetic field orientations; and

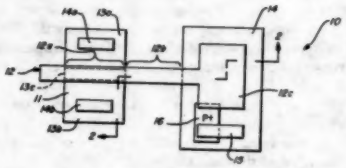
bias layer means coupled to the data layer means for providing a biasing field as a function of the temperature of the bias layer means for obtaining the domains of desired magnetic field orientations in the data layer.

4,649,520

SINGLE LAYER POLYCRYSTALLINE FLOATING GATE

Boaz Eitan, Sunnyvale, Calif., assignor to WaferScale Integration Inc., Fremont, Calif.

Filed Nov. 7, 1984, Ser. No. 669,198
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—185 14 Claims



1. A programmable read only memory comprising

a substrate of a first conductivity type;

a source region of a second conductivity type opposite to said first conductivity type formed in said substrate;

a drain region of said second conductivity type formed in said substrate and separated from said source region by a first intermediate region of said substrate;

a third region of said second conductivity type formed in said substrate and separated from said source region and said drain region by a second intermediate region of said substrate;

insulation formed over said source region, said drain region, said third region, and said first and second intermediate regions;

conductive means for causing a conductive path to form between said source region and said drain region, said conductive means formed on said insulation and extending over said third region, said second intermediate region and said first intermediate region; and

means for applying a first electrical potential to said source

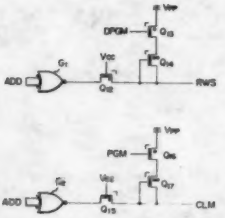
region, a second electrical potential to said drain region and a third electrical potential to said third region.

4,649,521

PROGRAMMABLE READ-ONLY MEMORY (PROM) DEVICE HAVING REDUCED PROGRAMMING VOLTAGE CAPABILITY

Manabu Tsuchida, Yokohama, and Masanobu Yoshida, Kawaguchi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 26, 1984, Ser. No. 674,813
Claims priority, application Japan, Nov. 24, 1983, 58-219329
Int. Cl.[4] G11C *7/00, 11/40*
U.S. Cl. 365—185 **11 Claims**



1. A programmable read-only memory device comprising:

a plurality of memory cell transistors arrayed in columns and rows and each having a source, a drain, a floating gate and a control gate formed above said floating gate;

a means for generating a column selection signal which applies a high programming voltage to the drain of a memory cell transistor of a selected column under control of a program signal, said means being connected to a source of a high programming voltage, the drain of said memory cell transistor and said program signal;

a means for generating a row selection signal which applies a high programming voltage to the control gate of a memory cell transistor of a selected row under control of a delayed-program signal; and

a delay means for receiving said program signal, and for generating a delayed-program signal supplied to said means for generating a row selection signal, for delaying the application timing of said high programming voltage from said means for generating a row selection signal to the control gate of the memory cell transistor of the selected row with respect to the application timing of the high programming voltage from said means for generating a column selection signal to the drain of the memory cell transistor of the selected column,

whereby a programming operation is performed for a memory cell transistor of a selected column and row by applying the high programming voltage to the control gate of the memory cell transistor at an application timing delayed with respect to the application timing of the high programming voltage applied to the drain of the memory cell transistor.

4,649,522

FAST COLUMN ACCESS MEMORY

Howard C. Kirsch, Emmaus, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 11, 1985, Ser. No. 700,459
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—189 **5 Claims**

1. An integrated circuit random access memory comprising:

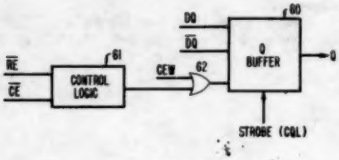
a multiplicity of memory cells;

row decoding means adapted to select a desired row of memory cells when a row enable signal ($\overline{RE}$) is applied;

column decoding means adapted to accept a column address and to select a specified column of memory cells each time a column enable signal ($\overline{CE}$) is applied;

CHARACTERIZED IN THAT

said integrated circuit further comprises means for providing valid output data read onto a data output line from at least two selected memory cells located on a given selected



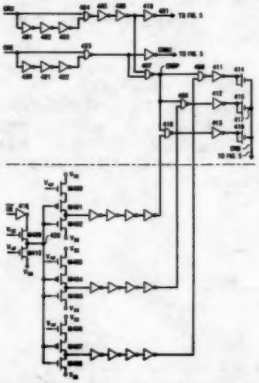
row, with said providing beginning with the first application of said column enable ($\overline{CE}$) signal following an application of said row enable ($\overline{RE}$) signal, and ending when both said row enable ($\overline{RE}$) and column enable ($\overline{CE}$) signals are terminated, and with said data output line being placed in a high impedance state at times other than said providing.

4,649,523

SEMICONDUCTOR MEMORY WITH BOOSTED WORD LINE

Clinton H. Holder, Jr., Catasauqua; Howard C. Kirsch, Emmaus, both of Pa., and James H. Stefany, Asbury, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 8, 1985, Ser. No. 699,661
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—203 **4 Claims**



1. An integrated circuit comprising an array of memory cells adapted to operate at a power supply voltage and arranged in rows and columns, with said memory cells comprising an access transistor and an information storage capacitor, wherein a column conductor is connected to a column of said memory cells and a row conductor is connected to the control terminals of the access transistors in a row of said memory cells; and further comprising row selection means for selecting a given row by applying a row voltage to the row conductor thereof, characterized in that

said integrated circuit further comprises means for boosting said row voltage in excess of said power supply voltage during an initial period following said selecting a given row, and for thereafter reducing said row voltage to a level equal to said power supply voltage during a subse-

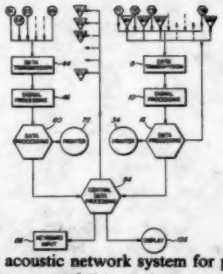
quent period of the memory cycle prior to the refresh portion of the memory cycle.

4,649,524

INTEGRATED ACOUSTIC NETWORK

James B. Vance, Saskatoon, Canada, assignor to Potash Corporation of Saskatchewan Mining Limited, Saskatchewan, Canada

Filed Aug. 22, 1983, Ser. No. 525,534
Claims priority, application Canada, Jul. 5, 1983, 431842
Int. Cl.[4] G01V 1/00
U.S. Cl. 367—13 15 Claims



1. An intergrated acoustic network system for providing a warning of impending groundfall in a mine comprising:

an array of high frequency microseismic sensor means situated at space locations in said mine to receive high frequency microseismic signals related to movement in ground formations adjacent said mine;

an array of at least four low frequency seismic sensor means situated at spaced locations in said mine to receive low frequency seismic signals related to stress build up in ground formations adjacent said mine;

data processing means;

means for transmitting said high and low frequency signals from said arrays to said data processing means;

said high frequency sensor means being utilized for time prediction and said low frequency sensor means being utilized for location prediction;

said data processing means processing signals from said high and low frequency arrays to calculate a ratio of energy/event count to provide a distinct anomaly prior to groundfalls and thereby recognize and determine the location of an impending ground failure; and

a warning system connected to said data processing means to receive signals of an impending ground failure therefrom.

4,649,525

SHEAR WAVE ACOUSTIC LOGGING SYSTEM

Frank A. Angona, and Joseph Zemanek, Jr., both of Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 328,564, Dec. 8, 1981. This application Aug. 22, 1985, Ser. No. 767,679
Int. Cl.[4] G01V 1/40; H01L 41/08
U.S. Cl. 367—31 3 Claims

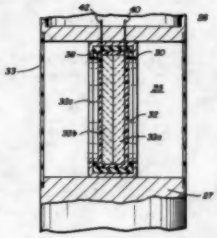
1. In the acoustic logging of a liquid-filled well penetrating a subterranean formation, the method comprising:

(a) lowering within said well a well logging tool having a bender-type first transducer with opposed unrestricted piezoelectric planar surfaces oriented along the axis of said logging tool;

(b) locating within said logging tool at least one second transducer spaced longitudinally along said logging tool from said first transducer;

(c) continuously pulling said logging tool upwardly through said well;

(d) exciting said bender-type first transducer while it is being pulled through said well by applying voltage spikes at a select repetition rate to said opposed planar surfaces to cause said opposed planar surfaces to resonate in response to each said voltage spike and thereby generate in said liquid-filled well repetitive, asymmetric acoustic radiation patterns each comprised of a positive pressure wave in one direction and a simultaneous negative pressure wave in the opposite direction, said asymmetric radiation patterns being converted to shear waves at the interface between said well and the formation surrounding the well; and



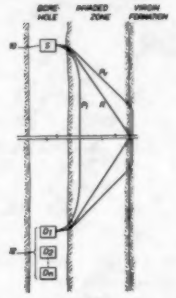
(e) monitoring the travel of said shear waves through said formation between said first transducer and said second transducer by detecting at said second transducer the asymmetric radiation patterns produced within the liquid-filled well as said shear waves leave said formation and re-enter said well adjacent the spaced-apart location along said logging tool of said second transducer.

4,649,526

METHOD AND APPARATUS FOR MULTIPOLE ACOUSTIC WAVE BOREHOLE LOGGING

Graham A. Winbow, and Lawrence J. Baker, both of Houston, Tex., assignors to Exxon Production Research Co., Houston, Tex.

Filed Aug. 24, 1983, Ser. No. 525,910
Int. Cl.[4] G01V 1/40
U.S. Cl. 367—35 21 Claims



13. A method for determining the radial thickness of an invaded zone of an earth formation surrounding a borehole where a virgin earth formation surrounds the borehole and is separated from the borehole by said invaded zone, said method comprising the steps of:

(a) transmitting a 2^n-pole P-wave from a point in the borehole into the earth formation surrounding the borehole, n being an integer greater than zero;

(b) measuring the P-wave velocity of a zone of the earth formation located at a first radial distance from the borehole by detecting the arrival of the 2^n-pole P-wave at a first location and at a second location in the borehole spaced longitudinally along the borehole from the point of transmission and from each other, where the second location is spaced farther from the point of transmission than is the first location, and measuring the time interval between the detections of said 2^n-pole P-wave arrival at said first location and said second location; and

(c) repeating the steps (a) and (b) with successively increased longitudinal spacings between said point of transmission and said first location and between said point of transmission and said second location to measure the P-wave velocities of zones of the earth formation located successively radially farther away from the borehole until the P-wave velocities measured in two consecutive measurements are substantially the same and are substantially equal to Cv, and determining the radial thickness t of the invaded zone of the earth formation from the known velocity Ci of P-waves in the invaded zone, by identifying Cv as the velocity of P-waves in the virgin formation, and determining t from the relationship:

$$t=(z/2)(((Cv/Ci)-1)((Cv/Ci)+1))^{\frac{1}{2}},$$

where z is the smallest spacing between said point of transmission and said first location at which said substantially constant P-wave velocity measurement is obtained.

4,649,527

ULTRASONIC PROXIMITY SWITCH

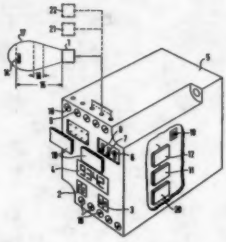
Alfred Forster, Schwandorf; Helmut Riss, Amberg, and Heinz Walker, Kuemmersbruck, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 2, 1985, Ser. No. 762,123

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1984, 3428773

Int. Cl.[4] G01S 7/52

U.S. Cl. 367—108 **15 Claims**



1. For Use with a sensor an ultrasonic proximity switch, UPS, with a range selection, controla and amplification circuit comprising:

a housing in which the range selection, control and amplification circuit of the ultrasonic proximity switch are house, said housing being remotely locatable from the sensor;

a potentiometer mounted to said housing and electrically connected to the range selection, control and amplification circuit for setting the range;

a first potentiometer consisting of a first encoding switch electrically connected to said range selection, control and amplification for setting a minimum range limit;

a second potentiometer consisting of a second encoding switch electrically connected to said range selection, control and amplification circuit for setting a maximum range limit; and

an actual value display electrically connected to said range selection, control and amplification circuit and displaying a range to an object regardless of the settings of said first and second encoding switches.

4,649,528

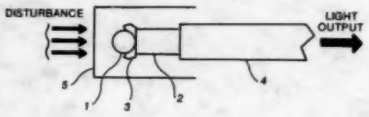
OPTICAL PIN APPARATUS FOR MEASURING THE ARRIVAL TIME AND VELOCITY OF SHOCK WAVES AND PARTICLES

Robert F. Benjamin, 315 Rover Blvd., Los Alamos, N. Mex. 87544, assignor to Robert F. Benjamin, Los Alamos, N. Mex.

Filed Oct. 18, 1983, Ser. No. 542,958

Int. Cl.[4] H04R 23/00

U.S. Cl. 367—149 **22 Claims**



13. An optical pin for determining the time of arrival and the velocity of an impinging shock-wave front, said optical pin comprising in combination:

a. a plurality of serially disposed, spaced-apart fluid-filled microballoons, each of said fluid-filled microballoons being responsive to the impinging shock-wave front and producing and emitting a bright flash of light therefrom, there being a first fluid-filled microballoon and a last fluid-filled microballoon in said plurality thereof;

b. at least one light transmitting plastic rod section interposed in optical contact between said fluid-filled microballoons, said first fluid-filled microballoon and said last fluid-filled microballoon each being in optical contact with only one of said plastic rod sections, said rod sections becoming opaque and non-transmitting after interacting with the impinging shock-wave front, thereby permitting the velocity of the impinging shock-wave front to be determined, the velocity being inversely proportional to the length of said plastic rod section;

c. at least one optical fiber for receiving and transmitting said emitted flash of light, one end of said optical fiber being in optical contact with said last fluid-filled microballoon;

d. opaque shielding means which covers and protects said fluid-filled microballoons from any low-pressure pulses and stray light which precede the impinging shock-wave front, said shield being easily ruptured by the impinging shock-wave front thereby exposing said fluid-filled microballoons to the impinging shock-wave front; and

e. means for receiving and detecting said emitted flash of light transmitted through said optical fiber.

4,649,529

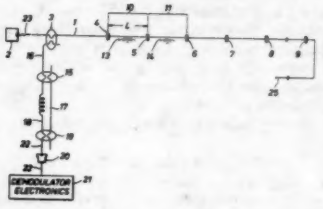
MULTI-CHANNEL FIBER OPTIC SENSOR SYSTEM

Kenneth Avicola, Kingwood, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Dec. 2, 1985, Ser. No. 803,456

Int. Cl.[4] H04R 23/00

U.S. Cl. 367—149 **14 Claims**



1. A data gathering system, including:

a main optical fiber through which an interrogating light signal may propagate in a first direction;

at least three reflectors formed on the main fiber such that each reflector is separated from the nearest reflector thereto by a section of the main fiber having length L, where each reflector is capable of operating in an active state in which the reflector will reflect a portion of the interrogating light signal so that the reflected portion will propagate in a direction opposite the first direction, and each reflector is also capable of operating in a deactivated state in which the interrogating light signal may propagate substantially unhindered past the reflector and where each reflector includes a substrate bonded to the main fiber through which acoustic signals may propagate, and means for generating both a first acoustic wave which will propagate from the substrate into an interaction portion of the main fiber so as to propagate in the main fiber in a second direction at an angle approximately 45° with respect to the axis, and a second acoustic wave which will propagate from the substrate into the interaction portion so as to propagate in the main fiber in a third direction at an angle approximately 45° with respect to the axis and approximately perpendicular to the second direction; and

a phase sensitive detector capable of measuring phase modulations associated with pairs of reflected signals, where each reflected signal in each pair originates at a pair of adjacent reflectors, and where the energy in both reflected signals in each pair is reflected from the same interrogating light signal.

4,649,530

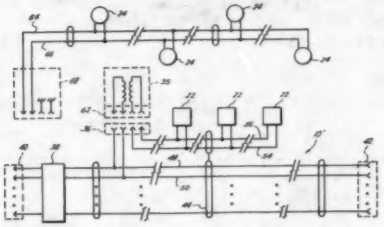
COMBINATION SEISMIC CABLE

James A. Porter, Jr., Houston, Tex., assignor to Litton Resources Systems, Alvin, Tex.

Filed Apr. 19, 1985, Ser. No. 724,898

Int. Cl.⁴ G01V *1/20, 1/38*

U.S. Cl. 367—154 **13 Claims**



1. A combination bay/land cable including transmission means coupled to a remote recording device, comprising:

(a) a plurality of pressure sensors coupled to said cable at predetermined spacings;

(b) a plurality of connectors disposed along said cable at predetermined spacings, each of said connectors having a first conductor means coupled to at least one of said pressure sensors and a second conductor means coupled to said transmission means;

(c) an impedance matching device, independent and separate from said pressure sensors, detachably coupled to a preselect number of said connectors for interconnecting at least one of said pressure sensors to said transmission means; and

(d) at least one motion sensor detachably coupled to a preselected number of said connectors interconnecting said motion sensor to said transmission means.

4,649,531

APPARATUS FOR CENTERING, ALIGNING AND CLAMPING AN OPTICAL DISC

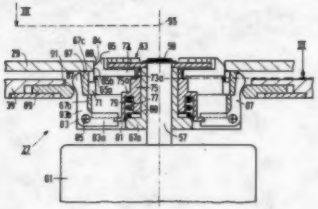
Paul Horowitz, Eindhoven, and Rudolf J. G. A. van der Hoorn, Nuenen, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 19, 1985, Ser. No. 725,184

Claims priority, application Netherlands, Nov. 26, 1984, 8403582

Int. Cl.⁴ G11B *9/06, 17/02*

U.S. Cl. 369—270 **13 Claims**



1. A device for centering, aligning and clamping a rigid disc in an operating position in a disc drive unit, said disc having a center hole bounded by a wall, said disc being subject to inscription and/or reading when rotated in said disc drive unit, comprising:

a drive spindle rotatable about an axis of rotation, said drive spindle having a free end;

disc alignment means arranged on said drive spindle to align said disc in an operating position in a plane perpendicular to the axis of rotation of said drive spindle;

a coaxial sliding bush positioned around said drive spindle and slidable along said spindle from a first position to a second position;

a centering device positioned near the free end of said spindle and rotatable with said spindle, said centering device including a plurality of radially movable centering members, said centering members at one end being resiliently connected to and pivotable about a mounting ring which is fixed relative to said drive spindle, said members having first centering surfaces for moving and pressing radially outwardly against said wall of said disc center hole when said disc is in said operating position, said centering members each extending radially inward from said mounting ring to an opposite end which cooperates with said coaxial sliding bush;

actuating means for axially sliding said sliding bush from said first position to said second position;

resilient means for returning said sliding bush to said second position from said first position,

said centering members pivoting, when said sliding bush moves from said first to said second position, to press radially outward against said wall of said disc center hole, said centering members moving towards said spindle to release said first centering surfaces from said hole wall when said sliding bush moves from said second to said first position, said cooperation between said sliding bush and each said centering member causing said pressing and releasing movements of said first centering surfaces.

4,649,532

DISC-RECORD PLAYER COMPRISING A PRESSURE MEMBER FOR PRESSING A RECORD DISC AGAINST THE TURNTABLE

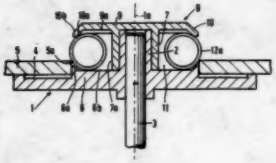
Ghislanus M. A. M. Aldenhoven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 4, 1985, Ser. No. 719,949

Claims priority, application Netherlands, Apr. 20, 1984, 8401304

Int. Cl.[4] G11B 25/04

U.S. Cl. 369—270 7 Claims



1. A disc player comprising

a turntable for receiving a disc thereagainst, said turntable having an axis of rotation;

a generally cylindrical mandrel projecting above said turntable coaxially with said axis, said mandrel being sized substantially the same as a central hole in said disc, said mandrel having therein an annular space which is open at the circumference of the mandrel;

a toroidal coil spring in said annular space, said spring being loaded in compression and having turns which are each substantially coplanar with said turntable axis, the outer circumference of said spring extending beyond the circumference of said mandrel where said annular space is open, the inner circumference of said spring being clear of the mandrel, said spring having a central plane parallel to said turntable and spaced therefrom by a distance sufficient to ensure pressing said disc against said turntable, said distance being greater than the maximum expected disc thickness.

4,649,533

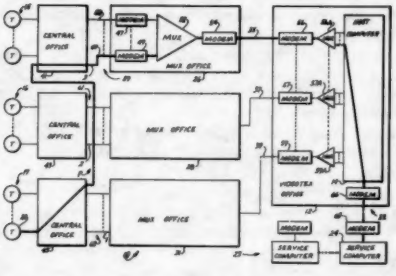
METHOD AND APPARATUS FOR RETRIEVING REMOTELY LOCATED INFORMATION

William Chorley, Plymouth, Minn.; Robert Redding, Chicago, and Christopher Fries, Crystal Lake, both of Ill., assignors to Keycom Electronic Publishing, Chicago, Ill.

Filed Oct. 25, 1983, Ser. No. 545,068

Int. Cl.[4] H04Q 11/04

U.S. Cl. 370—58 16 Claims



1. An information retrieval system for establishing connections through a switching system to a remotely located host computer, comprising:

a group of terminals, each one of the terminals being coupled to said switching system via a corresponding one of a plurality of communication paths;

said terminals each include:

manual input means for enabling the user to communicate with the switching system;

memory means for storing a plurality of individual items of call origination information;

call origination means coupled to the corresponding communication path for transmitting said items of call origination information via said corresponding communication path to the switching system for causing it to extend the corresponding communication path to the host computer; and

logic means for transferring the items of call origination information to said call origination means;

prioritizing means for designating a priority associated with a first item and a second item of the plurality of individual items of call origination information, to produce an ordered sequence of priorities based upon a cost associated with each one of the first and second items of call origination information;

means for causing said logic means to transfer a first one of said items of said call origination information to said call origination means in an attempt to extend a communication path to said host computer;

means for receiving a busy signal indicative of an unsuccessful attempt to extend the communication path; and

means responsive to said busy signal and to said prioritizing means for cuasing said logic means for causing said logic means to transfer a second one of said items of a lower priority to said call origination means in a further attempt to extend a communication path to said host computer.

4,649,534

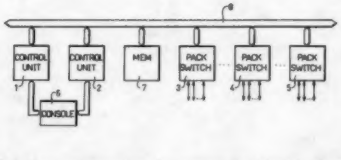
TELECOMPUTER PACKAGE SWITCHING SYSTEM

Jesus Manjarres, Madrid, Spain, assignor to Compania Telefonica Nacional de Espana, S.A., Spain

Filed Nov. 30, 1984, Ser. No. 676,798

Int. Cl.[4] H04Q 11/04

U.S. Cl. 370—60 8 Claims



1. A telecomputer system for processing data including data received from subscribers, comprising:

a shared communication path;

two control units connected to said shared communication path, each independently capable of controlling an automatic maintenance of the system, the taking of measurements and statistics of the system and controlling a plurality of peripherals for the system;

a shared memory connected to said shared communication path for receiving, storing and transmitting stored information from a plurality of sources on said shared communication path;

a console connected to said two control units for receiving and displaying information from said control units and for supplying information to said control units; and

a plurality of packet switches each connected to said shared communication path and each for controlling data from subscribers of the system, for controlling the receipt and transmission of data using line interfaces, for controlling

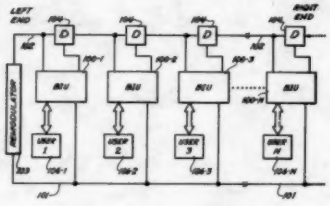
data transfer to other packet switches and to at least one of said control units, for controlling exchange of information with said shared memory and for controlling internal maintenance, measurements and statistics for itself.

4,649,535

METHOD AND APPARATUS FOR MAINTAINING A DYNAMIC LOGICAL RING IN A TOKEN PASSING LAN

Mehmet E. Ulug, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 13, 1985, Ser. No. 733,015
Int. Cl.[4] H04J 3/16
U.S. Cl. 370—86 **23 Claims**



1. In a token passing local area network (LAN) wherein a plurality of participating bus interface units (BIUs) transmit a token from a predecessor participating BIU to a successor participating BIU via a common transmission bus, a method for maintaining a dynamic logical ring such that a nonparticipating BIU wishing to enter said logical ring to participate in the passing of said token can initiate entrance thereto, said method comprising the steps of:

(a) said nonparticipating BIU transmitting a solicit successor signal to initiate entrance to said logical ring;

(b) responsive to said solicit successor signal, said participating BIUs cooperating to determine which one of said participating BIUs will be the successor to said entering BIU;

(c) said determined successor determining which one of said participating BIUs will be the predecessor to said entering BIU; and

(d) re-establishing said logical ring such that said token will be passed from said determined predecessor to said entering BIU and then to said determined successor thereby allowing said entering BIU to participate in the passing of said token.

4,649,536

FLEXIBLE MULTIPLEX SYSTEM FOR TIME DIVISION MULTIPLEX

Jerome V. Krinock, Owensboro, Ky., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 23, 1985, Ser. No. 778,902
Int. Cl.[4] H04J 3/07
U.S. Cl. 370—102 **3 Claims**

1. A flexible multiplex system for time division multiplexing a selectable number, n, which is less than or equal to the system capacity, N, of asynchronous digital signals having data rates within a specified tolerance of a nominal rate, requiring bit stuffing for synchronizing the signals into a common stream, comprising:

(a) signal sources, each providing data and clock signals;

(b) n signal synchronizers, which accept the data and clock signals from said n signal sources, respectively, and output n synchronized data signals in synchronism with a transmit clock, whose rate is slightly faster than the fastest of said clock signals, indicating with bit-stuff indications when slips have occurred;

(c) multiplexing means at a first location comprising:

first means for selecting the number n, said multiplexing means being coupled to the signal synchronizers for interleaving said n synchronized data signals into blocks of length l+m, each comprising m data bits followed by one control bit, where m is a highly composite number;

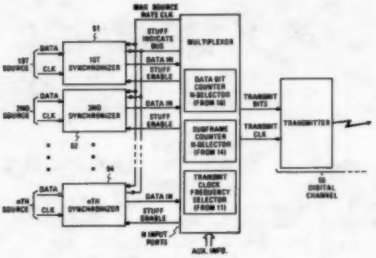
a fixed number S of said blocks being concatenated into a subframe;

corresponding control bits in each subframe being reserved for multiframe marker and bit-stuff indication;

n of said subframes being concatenated into a multiframe;

said bit stuff indication in each of the n subframes being reserved for passing synchronization information for one of the n synchronized data signals;

said multiframe marker in one of the subframes being recognizably different from the multiframe marker in the others, to facilitate identification of the bit-stuff indication in that subframe with a particular one of said synchronized data signals;



(d) a digital transmission channel for coupling said multiplexed bit stream and said transmit clock from the output of said multiplexing means at said first location to a second location as received bits and received clock, respectively;

(e) demultiplexing means at said second location comprising:

second means for selecting the number n, said demultiplexing means separating said received bits into output data signals and stuff indications;

(f) n signal desynchronizers, which accept the output data signals from said n demultiplexer outputs respectively, discard bits that occur when destuff indications from their corresponding synchronizers are active, and elastically store the remaining bits to smooth out the discontinuities resulting from the input bits being discarded; and

(g) n signal output terminals from said n signal desynchronizers, respectively.

4,649,537

RANDOM PATTERN LOCK AND KEY FAULT DETECTION SCHEME FOR MICROPROCESSOR SYSTEMS

Mark A. Rosswurm, Jackson Township, Allen County, and Leland L. Kesaler, Lima, both of Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 22, 1984, Ser. No. 663,526
Int. Cl.[4] G06F 11/04
U.S. Cl. 371—16 **16 Claims**

1. An electronic control unit comprising:

storage means having an input for receiving a random data word having a plurality of bits;

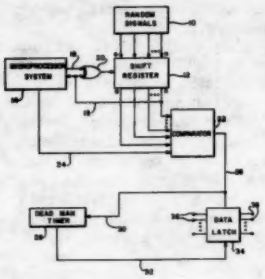
a data processor having an input for receiving said random data word from said storage means and having an output;

said data processor being adapted to read said random data word in said storage means and to restore said random data word to said storage means;

said data processor being further adapted to conduct a series of self-tests and to subsequently output a first data word having a particular relationship to said random data word;

means for combining said first data word with said random

data word to produce a predetermined second data word when said data processor is operating properly; and



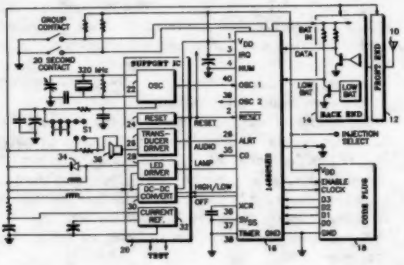
means for producing an unlock signal in response to the production of said predetermined second data word.

4,649,538

RADIO PAGING DEVICE WITH IMPROVED TEST MODES

Michael J. DeLuca, Sunrise, and William G. Siegel, Plantation, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 3, 1984, Ser. No. 657,425
Int. Cl.[4] H04B 3/46
U.S. Cl. 371—25 **22 Claims**



1. A method of testing a receiver capable of receiving at least one group of transmitted signals, said method comprising the steps of:

transmitting at least one group of signals of a plurality of groups to the receiver, the at least one group of signals including at least one test code;

detecting at the receiver the transmitted signals;

decoding each group of transmitted signals for producing a decoded signal, each decoded signal including a decoded test code;

comparing the decoded test code of each said decoded signal with a reference signal having a test code identical to the transmitted test code to determine the degree of similarly between each said decoded signal and said reference signal;

classifying into at least three classifications of said decoded signal in accordance with the difference between the decoded test code and the identical test code of said reference signal;

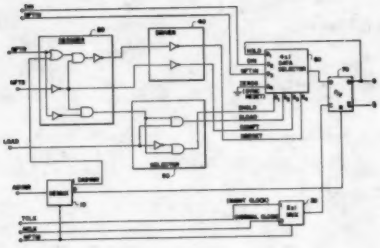
generating a signal indicative of the classification of each of the decoded signals.

4,649,539

APPARATUS PROVIDING IMPROVED DIAGNOSABILITY

Steven L. Crain, Phoenix, and Homer W. Miller, Peoria, both of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Nov. 4, 1985, Ser. No. 795,035
Int. Cl.[4] G06F 11/00; G11C 11/40; G01R 31/28
U.S. Cl. 371—25 **6 Claims**



1. An apparatus for storing information contained in a selected digital data signal coupled to said apparatus, said digital data signal having at least two states, wherein a first state is defined as a set state and a second state is defined as a reset state, said apparatus comprising:

(a) selector means, having a first, a second, and a third input terminal and an output terminal, said first input terminal adapted to receive an operational digital data signal when said apparatus is operating in a normal mode, said second input terminal adapted to receive a shifted test data signal when said apparatus is operating in a maintenance mode, and said third input terminal is operatively connected to a signal having a constant reset state, said first and second input terminals being the data input terminals of said apparatus, for operatively connecting one of said first, second, and third input terminals of said output terminal in response to a first and second control signal;

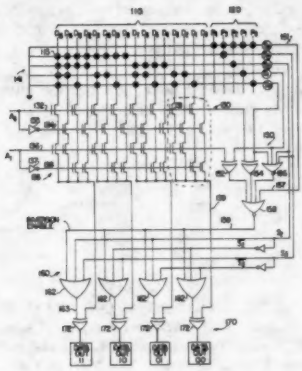
(b) storage means, having an input terminal operatively connected to the output terminal of said selector means, having an output terminal indicative of the state of said storage means and of said apparatus, having a clock input terminal adapted to receive a clock signal and having a reset terminal adapted to receive a reset signal, for storing the state present at the selected input terminal of said selector means coincident with said clock signal; and

(c) switching means, having an input terminal adapted to receive said second control signal, said switching means being operatively connected to said reset terminal of said storage means, and further operatively connected to said selector means, for coupling said second control signal to said storage means when said apparatus is in said normal mode thereby causing said apparatus to be placed in said second state immediately upon the occurrence of said second control signal asynchronously to said clock signal, and coupling said second control signal to said selector means in the maintenance mode, thereby causing the third input terminal of said selector means to be operatively connected to said output terminal of said selector means, causing said apparatus to be placed in the second state coincident with said clock signal, said second control signal having priority over the first control signal in the selection of the input terminals of said selector means.

4,649,540
ERROR-CORRECTING CIRCUIT HAVING A REDUCED SYNDROME WORD

Robert J. Proebsting, Argyle, Tex., assignor to Thomson Components-Mostek Corp., Carrollton, Tex.

Filed Dec. 26, 1984, Ser. No. 686,333
Int. Cl.[4] G06F 11/10
U.S. Cl. 371—37 12 Claims



1. An integrated circuit error-correction circuit for correcting up to one error in a data field carried by M data signals on a set of data lines (110) disposed in

a first region of said integrated circuit, each of said set of data lines having a sequential binary data address representative of the location of that data line within the set of data lines;

said circuit further comprising a set of parity lines (120) carrying a set of K parity signals formed in a predetermined manner from a set of input data signals where K is the least integer which satisfies the equation $2^K \geqq M+K+1$;

parity means for combining said set of parity signals and said data signals in a predetermined manner to generate a binary syndrome word (151) having K-1 bits; and

means (170) connected to the output of said parity means, for correcting a single data signal located at a binary error address specified by the contents of said syndrome word.

4,649,541
REED-SOLOMON DECODER

Charles R. Lahmeyer, Temple City, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 21, 1984, Ser. No. 673,685
Int. Cl.[4] G06F 11/10
U.S. Cl. 371—37 9 Claims

1. A decoder for decoding Reed-Solomon encoded data comprising

input means for receiving said encoded data in a stream of code blocks,

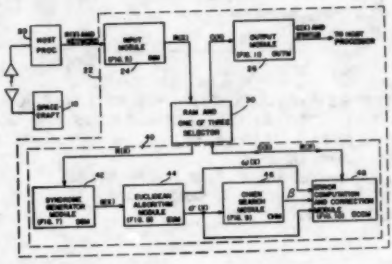
memory means coupled to said input means for storing said received encoded data,

processing means coupled to said memory means for performing decoding functions on said stored encoded data and returning processed data to said memory,

output means coupled to said memory means for transmitting decoded data from said decoder,

said memory means including three identical memories, one for storing encoded data to be decoded, one for storing data being decoded, and one for storing decoded data being transmitted out of the decoder, each memory having its own addressing means and data output terminals,

means for determining when each of said input means, processing means and output means have completed their respective functions on a different code block, and

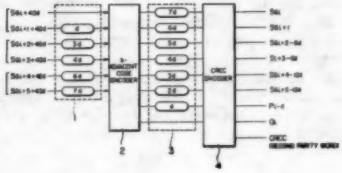


switching means responsive to said determining means for sequentially swapping memories between said input means, processing means and output means, whereby overall pipelining of code blocks is provided through said decoder without physically transferring code blocks through more than one memory.

4,649,542
DIGITAL SIGNAL TRANSMISSION METHOD PROVIDING HIGH ERROR CORRECTION CAPABILITY

Keizo Nishimura, Yokosuka; Masaharu Kobayashi, Yokohama; Hiroo Okamoto, Yokohama; Takaharu Noguchi, Yokohama; Takao Arai, Yokohama, and Toshifumi Shibuya, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 18, 1984, Ser. No. 621,743
Claims priority, application Japan, Jun. 17, 1983, 58-107693
Int. Cl.[4] G06F 11/10
U.S. Cl. 371—39 6 Claims



1. A digital signal processing method in which digital information words each divided into a plurality of information symbols are, for transmission, combined with sets of code error detecting and correcting parity words each set being provided for a group including a predetermined number of said information symbols, and each of said parity word sets having a first parity word destined primarily to serve for correction of a code error and a second parity word destined primarily to serve to detection of the code error, comprising the steps of:

generating as a first parity word at least a parity symbol created on the basis of each of first groups each having said predetermined number of information symbols which result from the division of original digital information words to be transmitted into information symbols, said first group including information symbols not belonging to the same original information words and combining the generated first parity words with the first groups of information symbols, respectively;

delaying the information symbols of said first group each combined with said first parity word on a basis of an information word in such a manner that second groups of

information symbols are arranged which differ from said first groups of information symbols, each second group including all the information symbols belonging to the same original digital information words and the first parity word; and

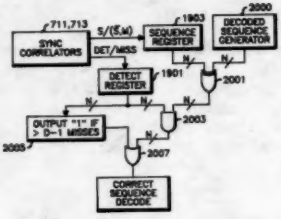
generating from said second groups of information symbols produced by said delaying step a second parity word by calculating information symbols of each of said second groups.

4,649,543

SYNCHRONIZATION SEQUENCE DECODER FOR A DIGITAL RADIOTELEPHONE SYSTEM

Stephen N. Levine, Chicago, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 30, 1985, Ser. No. 771,458
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—41 **34 Claims**



1. A decoder for decoding system states conveyed in sequences of multi-bit normal words and inverse words used for synchronizing digital messages transmitted over a radio channel which may introduce bit errors into said words, said decoder comprising:

means, responsive to the introduced bit errors, for detecting a normal word, an inverse word, and a word miss and for assigning a first binary level to said detected normal word, a second binary level to said detected inverse word, and a selected one of said binary levels to said word miss, thereby creating a selected sequence of binary levels;

means for generating a decoded sequence of binary levels corresponding to one of the system states; and

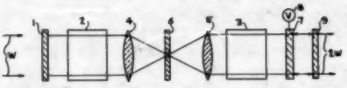
means for comparing said selected sequence and said decoded sequence and for indicating a correct system state decode when said selected and decoded sequences have a predetermined correlation therebetween.

4,649,544

ELECTRO-OPTIC HARMONIC CONVERSION TO SWITCH A LASER BEAM OUT OF A CAVITY

Roger A. Haas, Pleasanton, and Mark A. Henesian, Livermore, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 19, 1984, Ser. No. 662,642
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—22 **21 Claims**



1. A method for using electro-optic harmonic frequency conversion to switch a laser beam out of a laser cavity, comprising:

providing a laser cavity defining a closed optical path centered about an optical axis running in the closed optical path comprising two end mirrors, at least one amplifier medium, and at least one electro-optic harmonic conversion crystal;

pumping the at least one amplifier medium;

injecting a laser pulse into the laser cavity to travel in the closed optical path;

amplifying the laser pulse until a desired laser light energy is reached;

applying an electric field across the electro-optic harmonic conversion crystal in an effective amount for substantially converting the desired laser light energy to a harmonic frequency; and

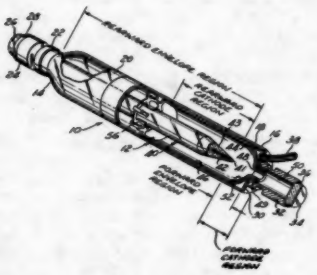
permitting the desired laser light energy, after being harmonically converted, to be substantially transmitted as a laser beam outside of the laser cavity.

4,649,545

COMPACT GAS LASER HAVING EXTENDED LIFE

Wei-long W. Lee, Covina; Michael J. Dorich, Vista, and Jeff W. Eerkens, Pacific Palisades, all of Calif., assignors to Melles Griot, San Marcos Company, San Marcos, Calif.

Filed Oct. 4, 1985, Ser. No. 784,377
Int. Cl.[4] H01S *3/03*
U.S. Cl. 372—61 **21 Claims**



1. A gas laser, comprising:

an elongate envelope for containing a laser gas;

an anode, in communication with said gas;

a tubular cathode, having a discharge current receiving surface for receiving discharge current from said anode in communication with said gas;

means for applying a potential difference between said anode and said cathode to generate said discharge current in said gas;

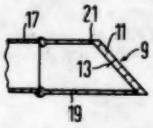
a capillary tube, disposed in said envelope, having a bore for providing a path for conducting said discharge current from said anode, said tube having a first opening adjacent to said anode for placing said bore in communication with said anode, and a second opening for discharging said current from said bore to said cathode, said tube having a reduced wall thickness through a transition portion adjacent to said second opening, said transition portion having an axial length greater than the radial wall thickness of said tube at said second opening; and

said cathode including a forward cathode region and a rearward cathode region, the current-receiving surface of said cathode in said rearward cathode region being substantially cylindrical and having a substantially uniform diameter.

4,649,546
GAS LASER

Rudolf Schmid, Ottobrunn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 6, 1984, Ser. No. 577,272
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1983, 3305462
Int. Cl.[4] H01S 3/02
U.S. Cl. 372—61 15 Claims

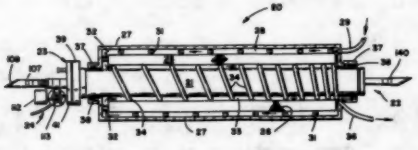


1. In a gas laser, comprising:
a tube having two ends to be filled with gas; and
a plate-shaped window hermetically sealing at least one of said ends of said tube;
said window including a carrier plate and a layer coating the inside of said carrier plate;
said tube being formed of a first material with a first thermal coefficient of expansion (H_1) at least in the vicinity of said one end thereof having said window;
said layer being formed of a second material being quartz with a second thermal coefficient of expansion (H_2);
said carrier plate being formed of a third material with a third thermal coefficient of expansion (H_3);
said first and second materials being thermally unadapted to each other; and
said third material being thermally matched to said first material.

4,649,547
GAS LASER CONSTRUCTION

Lee R. Carlson, Pleasanton; Denes A. Hegedus, Redwood City; Steven M. Jarrett, Los Altos; Michael F. Miller, Mountain View; Martin E. Riley, Grass Valley, and David L. Wright, Rough and Ready, all of Calif., assignors to Spectra-Physics, Inc., San Jose, Calif.

Filed Sep. 10, 1984, Ser. No. 649,206
Int. Cl.[4] H01S 3/03
U.S. Cl. 372—61 9 Claims

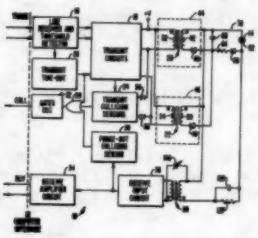


1. A plasma tube for a gas laser, produced by a method of assembly comprising the steps of:
providing a ceramic tube with an internal wall having a precise diameter with alternately metallized and non-metallized areas at regular intervals along a longitudinal axis of the tube;
stacking with a stacking gauge, outside the ceramic tube, a series of heat webs and insulative spacers, in alternating relationship, the heat webs being thereby spaced apart substantially the same distance as the metallized areas in the ceramic tube, and the heat webs being of less diameter than the internal wall of the ceramic tube and having brazing material coated on their outer surfaces;
inserting the stack of heat webs and spacers together into the ceramic tube so that each heat web is adjacent to and in registry with a metallized area on the internal wall of the ceramic tube; and
heating the resulting assembly in vertical orientation generally uniformly to a sufficient temperature to expand the heat webs diametrically so that each engages outwardly against the adjacent metallized area of the cermaic tube, with the brazing material melting and causing the heat webs to be brazed to the metallized areas of the ceramic tube
whereby the heat webs are evenly brazed to the precision-diameter ceramic tube in a secure bond at each metallized area, and post-brazing stresses in the ceramic tube are minimized.

4,649,548
LOCAL COMPUTER NETWORK TRANSCEIVER

Ronald C. Crane, 2101 California St., Mountain View, Calif. 94040

Continuation-in-part of Ser. No. 242,708, Mar. 11, 1981, Pat. No. 4,479,228. This application Sep. 26, 1983, Ser. No. 536,223
Int. Cl.[4] H04B 1/40
U.S. Cl. 375—7 14 Claims



13. A local computer network coaxial transceiver having a coaxial cable coupling, said coupling having a first terminal and a second terminal for coupling to a communication medium, said transceiver comprising:
a receive isolation transformer;
a nulling capacitor;
a high impedance means;
said receive transformer having a receive input side coupled through said high impedance to said coaxial cable coupling; said receive transformer having a receive output winding coupled to an amplifier circuit, said nulling capacitor being cross-coupled between said receive input winding and said receive output winding for nulling out undesired common mode voltages which may appear across said receive output winding.

4,649,549
APPARATUS FOR SYNCHRONIZING LINEAR PN SEQUENCES

Peter H. Halpern, Longwood; Peter E. Mallory, Edgewater; Paul E. Haug, Sanford, and William M. Koos, Jr., Altamonte Spring, all of Fla., assignors to Sophisticated Signals and Circuits, Longwood, Fla.

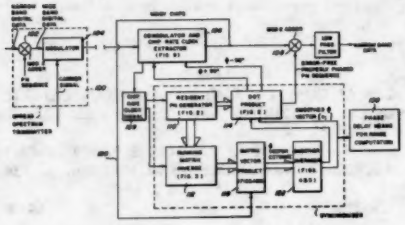
Continuation-in-part of Ser. No. 529,706, Aug. 30, 1983, abandoned. This application Jul. 18, 1984, Ser. No. 632,001
Int. Cl.[4] H04K 1/02; H04J 6/00
U.S. Cl. 380—32 13 Claims

1. Apparatus for synchronizing the linear PN sequences contained in the heavy noise background of a receiver data-carrying spread spectrum signal, comprising
(a) demodulator means (106, 109) for separating from the received signal the noisy wideband PN spread spectrum component, and for generating a chip rate clock signal;
(b) resident PN generator means (110) responsive to said

chip rate clock signal for producing a replica of the PN sequence with arbitrary phase;

(c) running matrix inverse means (112) for obtaining the inverse (R^{-1}) of the matrix (R) that is formed by n successive observations of the register of the resident generator;

(d) matrix vector product means (118) for multiplying the running inverse by a column vector of noisy chips, thereby to obtain a plurality of estimates of the phase vector;



(e) means (122) for smoothing and averaging the phase vector estimates, thereby to produce the smoothed phase vector (c_j);

(f) dot product means (114) responsive to said smoothed phase vector and to the contents of the resident shift register for producing the properly phased PN sequence; and

(g) despreading means (108) for combining the noisy chips with the properly phased PN sequence, whereby the narrowband digital data carried by the spread spectrum signal may be recovered.

4,649,550

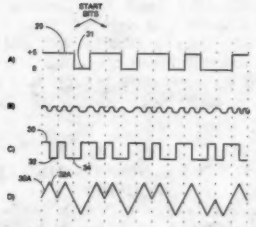
TELEMETRY SCHEME WITH SLOPE MODULATED SIGNAL

Houston B. Mount, II, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Filed Dec. 22, 1982, Ser. No. 452,254

Int. Cl.[4] H04L *27/00*

U.S. Cl. 375—37 **10 Claims**



1. A method of transmitting information contained in bits between a borehole instrument and the surface over a high capacitance transmission cable which comprises the steps of:

(a) generating a set of two segments for each said bit wherein one segment is of a magnitude different from that of the other to obtain an encoded signal;

(b) generating a slope modulated voltage signal in a high capacitance transmission cable with a constant current signal produced from said encoded signal of step (a) wherein said slope modulated voltage signal is within the working bandwidth of the high capacitance transmission cable and the high capacitance transmission cable is driven from one voltage to another at the maximum attainable rate for the constant current signal; and

(c) transmitting said slope modulated voltage signal along said transmission cable.

4,649,551

DECODER FOR A FREQUENCY-KEYED SIGNAL, PARTICULARLY AN FSK-VIDEO TEXT SIGNAL

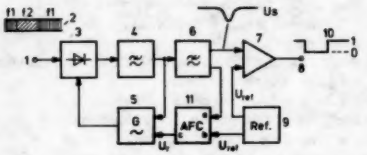
Hans-Dieter Sander, Loxstedt, and Wulf-Christian Streckenbach, Hemmingen, both of Fed. Rep. of Germany, assignors to Telefunken Fernseh und Rundfunk GmbH, Hanover, Fed. Rep. of Germany

Filed Jun. 20, 1984, Ser. No. 622,746

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1983, 3324311

Int. Cl.[4] H04L *27/14*

U.S. Cl. 375—81 **13 Claims**



1. A decoder for a frequency keyed signal (2), particularly an FSK videotext signal, comprising: a PLL circuit including a regulated oscillator and a phase comparison stage from which a signal voltage (Us) which changes between two values (U1, U2) is derived through a lowpass filter and is fed to an amplitude selective circuit whose output voltage is the output signal of said decoder and has two different values depending on whether said signal voltage (Us) is below or above a reference voltage (Uref); and an automatic frequency control circuit means for deriving a regulating voltage (Ur) from a difference ($\Delta U - \Delta U2$) between the first value and the second value (U1 and U2, respectively) of said signal voltage (Us) relative to said reference voltage (Uref) and for feeding said regulating voltage (Ur) to said oscillator so as to continuously regulate its natural frequency, said automatic frequency control circuit means including two capacitors (C1, C2) which store the respective two voltage values (U1, U2) of said signal voltage (Us) and which are connected together by means of a resistance network (R1, R2), and a comparison stage to which the voltage at a tap (d) of said network (R1, R2) and said reference voltage (Uref) are fed and which furnishes said regulating voltage (Ur).

4,649,552

ELECTRONIC PEDOMETER WITH STEP SENSOR IN REMOVABLE INSOLE

Kazuhiko Yukawa, Katano, Japan, assignor to Matsushita Electric Works, Ltd., Kadoma, Japan

Filed Dec. 31, 1984, Ser. No. 687,797

Claims priority, application Japan, Mar. 19, 1984, 59-52733; Mar. 24, 1984, 59-57028

Int. Cl.[4] G01C *22/00*; A43B *5/00*

U.S. Cl. 377—24 **3 Claims**

1. An electronic pedometer adapted to be fitted on a footwear which comprises:

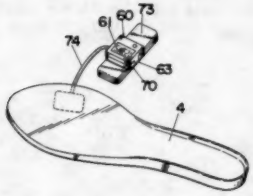
a step sensor for sensing each step that the foot fitted with the footwear makes during a walking or running motion of the user to provide an output indicative thereof;

a removable insole having said step sensor sealed thereto and said removable insole being insertable into the footwear, said insole being formed separately from the footwear;

a mount base separately formed from the footwear and having means by which it is secured to the footwear and

having thereon a first terminal which is electrically connected to said step sensor, said first terminal being wires to said step sensor of said insole by means of a flexible cable; and

an electronic counter having therein components forming a computing circuit, said counter being detachably mounted on said mount base and having a second terminal which is



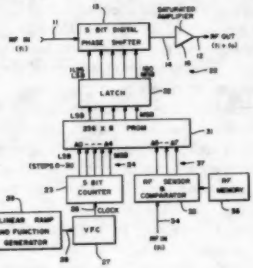
in electrical connection with said first terminal when mounted on the mount base so that the computing circuit is electrically connected to said step sensor to receive the outputs therefrom for computing, based upon the outputs, the number of steps taken , and said electronic counter including a display section indicating the resulting measurements by the circuit.

4,649,553

MICROWAVE DIGITAL PHASE-SHIFTER APPARATUS AND METHOD FOR CONSTRUCTION

Asad M. Madni, 3582 Greenfield Ave., Los Angeles, Calif. 90034, and Lawrence Wan, 17819 Joshua Cir., Fountain Valley, Calif. 92708

Filed Mar. 26, 1985, Ser. No. 717,132
Int. Cl.[4] H03K *5/159*
U.S. Cl. 377—43 **9 Claims**



1. Phase-shifter apparatus for receiving radar or other microwave signals and phase shifting or frequency translating them comprising:

a solid-state variable phase shifter including a plurality of series coupled cells for inserting various and different phase shifts into said received microwave signals by binary inputs to selected cells each of said cells providing a nominal or expected phase shift so that driving said binary inputs with an incrementally increasing or decreasing binary number will cause step increases or decreases in expected phase shift of the series combination of the cells;

multi-bit counter means having a number of binary outputs corresponding to said binary inputs of said plurality of cells for providing said binary number, said counter also having activating inputs including at least one of the group consisting of a clock input and a jam input;

memory means for connecting said multi-bit counter means to said phase shifter, said memory means having permanently stored therein a predetermined code corresponding to a corrected combination of selected cells to provide a minimal phase error compared to the phase error produced by the said binary incremental combinations of said cells; said predetermined combination being selectable by said counter means and

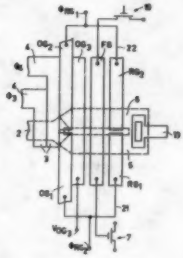
means for digitally driving said counter.

4,649,554

CHARGE TRANSFER DEVICE HAVING A SUBDIVIDED CHANNEL OUTPUT REGION

Arnoldus J. J. Boudewijns, and Leonard J. M. Esser, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 558,408, Dec. 5, 1983, abandoned. This application Jan. 15, 1986, Ser. No. 819,989
Claims priority, application Netherlands, Dec. 7, 1982, 8204727
Int. Cl.[4] G11C *19/28;* H01L *29/78*
U.S. Cl. 377—60 **2 Claims**



1. A charge transfer device, which comprises:

a semiconductor body having a major surface and a charge transfer channel;

a row of clock electrodes on said major surface of the semiconductor body and over said charge transfer channel;

a reading stage for detecting transferred charge packets;

means for supplying clock voltages to said row of clock electrodes during a clock period to transport information-representing charge pockets through said charge transfer channel to said reading stage;

said charge transfer channel being subdivided into at least first and second adjacent subchannels at the area of the reading stage, said subchannels comprising separate first gates, a common second gate and a separate third gate, charge packets being alternately introduced into said subchannels during operation by said separate first gates, said common second gate being capable of being held at an electrically floating potential during operation and providing an output signal representative of the size of the charge packet stored beneath said second gate, and said charge packet stored beneath said second gate being further transported by said third gates;

means for biasing said second gate at said floating potential during reading of a charge packet stored under said second gate in the first subchannel and subsequently reading a charge packet stored under said second gate in the second subchannel, so that output signals can be derived from said reading stage over substantially the whole clock period which are substantially constant over substantially the whole clock period and representative of the information to be read;

means for applying clock voltages to said first gates in phase opposition and for applying clock voltages to said third gates in phase opposition; and

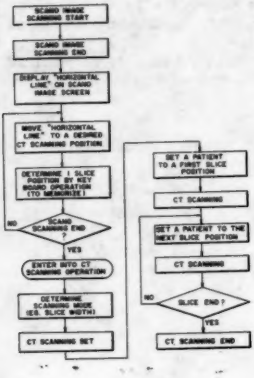
a further gate above each of the subchannels and between the first gates and the second gate, the first gate and the third gate being conductively connected together above each subchannel.

4,649,555

X-RAY COMPUTERIZED TOMOGRAPHIC APPARATUS

Takayuki Matsubayashi, Tochigi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 30, 1982, Ser. No. 445,751
Claims priority, application Japan, Dec. 1, 1981, 56-191798
Int. Cl.[4] G01N *23/00*; A61B *6/08*
U.S. Cl. 378—4 2 Claims


SCANO IMAGE SCANNING START
SCANO IMAGE SCANNING END
DISPLAY "HORIZONTAL LINE" ON SCANO IMAGE SCREEN
MOVE "HORIZONTAL LINE" TO A DESIRED CT SCANNING POSITION
DETERMINE 1 SLICE POSITION BY KEY BOARD OPERATION (TO BE INSERTED)
SCANO SCANNING END ?
NO
YES
ENTER INTO CT SCANNING OPERATION
DETERMINE SCANNING MODE (EG. SLICE WIDTH)
CT SCANNING SET
SET A PATIENT TO A FIRST SLICE POSITION
CT SCANNING
SET A PATIENT TO THE NEXT SLICE POSITION
CT SCANNING
SLICE END ?
NO
YES
CT SCANNING END

1. An X-ray computerized tomographic apparatus for obtaining X-ray computerized tomographic images in cross-sectional planes of an object under examination at a plurality of designated positions along a longitudinal axis of the object, comprising:

source means for projecting fan-shaped radiation beams toward the object;

detector means for receiving said fan-shaped radiation beams that have penetrated through the object so as to produce output signals representative of intensities of the penetrated beams;

first control means for translating the object along the longitudinal axis of the object to obtain a scanogram of the object, in accordance with said fan-shaped radiation beams being projected toward the object from said source means and said detector means receiving said fan-shaped radiation beams penetrating through the object;

display means for displaying said scanogram and including means for selectively positioning a plurality of line markers for determining the plurality of designated positions thereon at which the tomographic images are to be taken and a plurality of successive numerals respectively corresponding to said line markers, said successive numerals indicating priority scanning orders of the tomographic images;

addressing means for automatically successively addressing the object in a sequence from the position of the line marker accompaning the smallest numeral until the position of the line marker accompanying the largest numeral; and

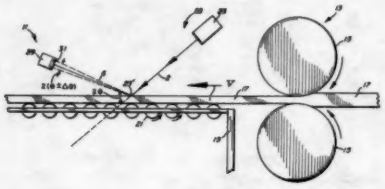
second control means for effecting a rotation of said source and detector means about the object so as to acquire the tomographic images at the designed positions that have been addressed by the addressing means in the indicated priority order.

4,649,556

METHOD AND APPARATUS FOR THE "ON-LINE", NONDESTRUCTIVE MEASUREMENT AND CONTROL OF GRAIN SIZE IN MATERIALS

Christine Rinik, Arlington, Mass.; Jerome B. Cohen, Glencoe, and John E. Hilliard, Evanston, both of Ill., assignors to Northwestern University, Evanston, Ill.

Continuation-in-part of Ser. No. 422,654, Sep. 24, 1982. This application Feb. 27, 1984, Ser. No. 584,115
Int. Cl.[4] G01N *23/20*
U.S. Cl. 378—71 19 Claims



1. A method for on-line measurement and process control of grain size at a plurality of depths in a material comprising the steps of:

traveling the materials and a predetermined measuring station relative to one another;

directing a plurality of incident beams, each incident beam comprising substantially monochromatic x-radiation and each incident beam having a unique wavelength, at the material as the measuring station and the material travel relative to one another, said incident beams having a predetermined transverse cross-sectional area so that over a plurality of time intervals the incident beams concurrently trace a plurality of substatially the same non-overlapping irradiated area segments;

detecting a time integrated intensity of diffracted radiation corresponding to a predetermined set of crystallographic planes over a range of depths of the material for each of the area segments on the material;

determining a relative variance of the time integrated intensity diffracted from the plurality of non-overlapping irradiated area segments for each unique beam wavelength;

determining a mean diameter for the grains at a plurality of depths using the relative variance of the integrated intensity;

varying at least one process parameter in response to the determined mean grain diameter of at least one depth to control grain size for at least one depth.

4,649,557

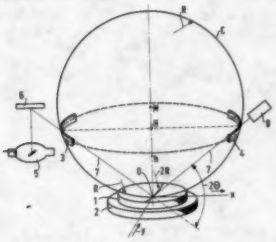
X-RAY ANALYSIS APPARATUS INCLUDING A MONOCHROMATOR CRYSTAL HAVING CRYSTAL LATTICE SURFACES

Jan Hornstra, and Mathias P. A. Viegers, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 22, 1984, Ser. No. 623,598
Claims priority, application Netherlands, Jun. 27, 1983, 8302263
Int. Cl.[4] H03D *3/22*
U.S. Cl. 378—84 14 Claims

1. An X-ray analysis apparatus comprising an X-ray source, a doubly curved monochromator crystal having doubly curved crystal lattice surfaces, said monochromator crystal exhibiting mutually and significantly different amounts of

surface curvature in different principal directions, and x-ray detector means for detecting X-rays from said monochromator



crystal, wherein said first principal direction is transverse to said second principal direction.

4,649,558

X-RAY DIAGNOSTIC SYSTEM WITH AN IMAGE INTENSIFIER TELEVISION CHAIN

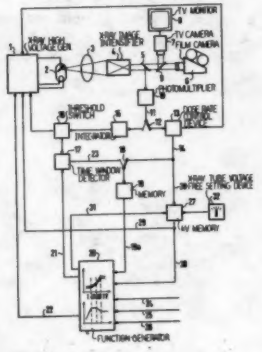
Klaus Brunn, Erlangen, and Walter Polster, Spardorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 234,423, Feb. 13, 1981. This application May 15, 1985, Ser. No. 734,803

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1980, 3009952

Int. Cl.[4] G03B *41/16*

U.S. Cl. 378—97 **3 Claims**



1. An x-ray diagnostic system comprising x-ray apparatus having an x-ray tube for producing an x-ray image and said x-ray tube being responsive during fluroscopy to the control of a fluoroscopy parameter comprising at least one of x-ray tube current and x-ray tube voltage for controlling a mean image intensity produced by means of said x-ray tube, an x-ray image intensifier television chain comprising an x-ray image intensifier (4) having an input means for receiving an input x-ray image as produced by said x-ray tube and having an output means for supplying an optical image in accordance with said input x-ray image, and video camera means (7) optically coupled with said output means of said x-ray image intensifier (4) for producing a video signal in accordance with said optical image supplied by said output means, dose rate control means operable during fluoroscopy for receiving a signal which is a measure of the mean image intensity produced by means of said x-ray tube and connected with said x-ray apparatus for controlling the fluoroscopy parameter to maintain the mean image intensity constant during fluoroscopy, automatic exposure control means connected with said x-ray apparatus for controlling the duration of an x-ray exposure operation of said x-ray tube to determine an actual exposure time, and including an integrator (15) for forming a dose signal corresponding to an x-ray dose supplied by the x-ray tube during an x-ray exposure operation, and a switching stage (16) connected with said integrator (15) and responsive to said dose signal for effecting a termination of an x-ray exposure when a prescribed x-ray dose value is achieved, and setting means connected with said x-ray apparatus and operable during x-ray exposure operation for setting x-ray tube voltage as a function of patient transparency, signal generation mean (20) connected with said x-ray apparatus and operable during x-ray exposure operation for generating respective pairs of first and second signal values for representing the power to be supplied to said x-ray tube and a relevant value of exposure time of an x-ray exposure for each respective patient transparency, transparency signal forming means connected with said signal generation means (20) for supplying a transparency signal to said signal generation means (20) in accordance with a fluoroscopy parameter of said x-ray tube during a fluoroscopy examination preceding an x-ray exposure operation, said signal generation means being operable during the x-ray exposure operation to supply a first output signal to said x-ray apparatus in accordance with a first of the pair of signal values corresponding to the transparency signal received from said transparency signal forming means thereby to select the power to be supplied to said x-ray tube, and being operable during an x-ray exposure operation to supply a second output signal in accordance with a second of the pair of signal values corresponding to the transparency signal received from said transparency signal forming means for representing a relevant value of exposure time suitable for the x-ray exposure operation, and a detector (17) connected with said signal generation means (20) for receiving said second output signal therefrom for comparison with actual exposure time as determined by said automatic exposure control means, said detector (17) being connected with said transparency signal forming means for actuating said signal generation means (20) to change at least one of said output signals when the detector (17) detects a deviation of the acutal exposure time from the relevant value of exposure time as represented by said second output signal from said signal generation means (20).

4,649,559

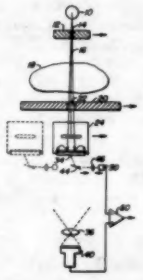
DIGITAL RADIOGRAPHY DEVICE

Shih-Ping Wang, Los Altos, Calif., assignor to Xonics Imaging, Inc., Sunnyvale, Calif.

Filed Oct. 31, 1983, Ser. No. 546,962

Int. Cl.[4] G03B *41/16*

U.S. Cl. 378—146 **3 Claims**



1. Apparatus for taking a radiograph of a stationary patient comprising a moving fan beam of x-rays defined by an x-ray source and a moving prescatter collimator slit located between the x-ray source and the stationary patient, at least one proximity type x-ray image intensifier device for the detection of the x-rays, said promimity type x-ray image intensifier device

including an output screen for transforming the x-rays into a visible radiographic image, a post scatter collimator slit located between the patient and the proximity type x-ray image intensifier device, means for moving both collimator slits and the proximity type x-ray image intensifier device in unison, a stationary tv pick-up camera device with its lens focused at the plane of the output screen of the proximity type x-ray image intensifier device to pick-up the visible radiographic image and to transform said image into electric signals for further digital image processing.

4,649,560

DIGITAL X-RAY STAND

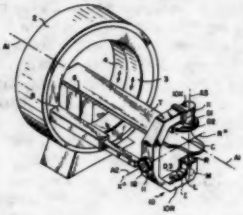
John K. Grady, c/o XRE Corporation, 300 Foster St., Littleton, Mass. 01460; Paul G. Rice, Lincoln, and Kip P. Van Steenburg, Wayland, both of Mass., assignors to John K. Grady, Littleton, Mass.

Filed Jan. 30, 1984, Ser. No. 575,204

The portion of the term of this patent subsequent to Sep. 10, 2002, has been disclaimed.

Int. Cl.[4] H05G *1/02*

U.S. Cl. 378—196 **17 Claims**



1. Radiological apparatus for examination of a patient comprising:

a base;

a first support mounted on the base for rotation about a first axis;

a table having a patient foot end and a patient head end along the first axis, the table being cantilever supported at one end and unsupported at the other end;

an arm attached to the support at one end only extendable along one side only of the table substantially the length of the table parallel to the first rotation axis from the supported end of the table to the unsupported end and leaving the other side of the table unobstructed;

a two-limbed carriage on the arm with limbs extending to positions on opposite sides of the first rotation axis, the limbs holding radiation source means and radiation receptor means respectively on a radiation axis; and

bearing means mounting the carriage on the arm for rotation about a second axis intersecting the first rotation axis, such that rotation of the support and arm about the first axis and the two-limbed carriage about the second axis allow radiation of a subject from substantially throughout spherical loci around the patient while maintaining the angular relation of the radiation means to the rotational axis without obstruction of access to the patient by the rotating support.

4,649,561

TEST PHANTOM AND METHOD OF USE OF SAME

Ben A. Arnold, 35 Red Hawk, Irvine, Calif. 92714, assignor to Ben Arnold, Irvine, Calif.

Filed Nov. 28, 1983, Ser. No. 555,608

Int. Cl.[4] G01D *18/00*

U.S. Cl. 378—207 **13 Claims**

1. A comprehensive X-ray apparatus test device comprising:

a base block sized to be positioned upon a support table of the X-ray apparatus;

a plate-like member formed to be removably mounted in a generally contiguous orientation upon said base block;

a plurality of test details disposed within said plate-like member; and

means for reproducibly aligning said base block with said plate-like member in said generally contiguous orientation, said base block and plate-like member being formed of a urethane material possessing X-ray absorption properties substantially similar to human soft tissue and;

said test details being formed of a stable iodine bearing material capable of maintaining its concentration value over prolonged use.

4,649,562

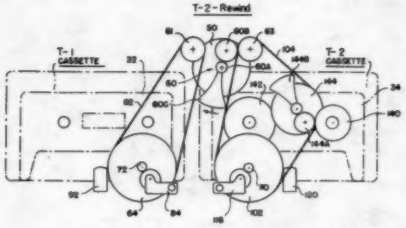
DRIVE MECHANISM FOR A TWO-TAPE TELEPHONE ANSWERING MACHINE USING A SINGLE REVERSIBLE MOTOR

Richard B. Kilstofte, Long Beach, Calif., assignor to Fortel, Inc., Compton, Calif.

Filed Nov. 13, 1984, Ser. No. 670,212

Int. Cl.[4] H04M *1/64*

U.S. Cl. 379—70 **4 Claims**



1. In a telephone answering machine which includes: a first magnetic tape unit on which an announcement is recorded for transmission to a calling party, first drive means mechanically coupled to the first magnetic tape unit, a second magnetic tape unit on which a message from the calling party is recorded, a second drive means mechanically coupled to the second magnetic tape unit, the combination of: a reversible drive motor having a drive shaft; and a centrifugal clutch mounted on the drive shaft of the motor to be driven thereby, said clutch automatically coupling said motor to said first drive means when said motor rotates in a first direction and to said second drive means when said motor rotates in the opposite direction, said clutch including a drive gear keyed to the drive shaft of the motor, an idler gear rotatable about an axis displaced from the axis of the drive shaft and coupled to the drive gear, said clutch functioning to move the idler gear into coupling relationship with the first drive means when the motor rotates in said first direction and into coupling relationship with the

second drive means when the motor rotates in said opposite direction.

4,649,563

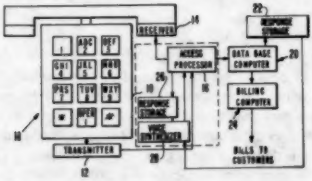
METHOD OF AND MEANS FOR ACCESSING COMPUTERIZED DATA BASES UTILIZING A TOUCH-TONE TELEPHONE INSTRUMENT

Bernard N. Riskin, Lambertville, N.J., assignor to R L Associates, Yardley, Pa.

Filed Apr. 2, 1984, Ser. No. 595,788

Int. Cl.[4] H04M *11/00*

U.S. Cl. 379—97 12 Claims



1. The method of utilizing a telephone instrument having transmitter and receiver components, and further including a touch pad having individually depressable alpha-numeric keys each representing a single number and a plurality of letters of the alphabet, to obtain a desired piece of information as a response to an inquiry generated at the situs of the instrument, that comprises the steps of:

(a) spelling out one of more words by a single depression, for each letter in a work, of only that key, and no others, that represents said letter;

(b) transmitting the alphabetically ordered inquiry, encoded as a numeric string, from the transmitter component of the instrument to a computer means;

(c) at the computer means, decoding the numeric string by selecting which of the several alphabetic characters represented by each depressed key will combine with similarly selected characters of the other depressed keys to form the spelled work or words, including the following sequence:

(1) responsive to the depression of the first and second numeric keys used, selecting only a letter or letters among those represented by the first key, and only a letter or letters among those represented by the second key, that can be validly combined as a first-and-second-letter pairing in the formation of a word, while rejecting all other letter combinations that cannot be so paired,

(2) responsive to the depression of the third key used, selecting only a letter or letters that can be combined with the selected letter(s) represented by the second key as a second-and-third-letter pairing in the formation of a word or words, while rejecting all other letter combinations that cannot be so paired, and

(3) continuing in like manner through the numeric string to determine similarly acceptable consecutive letter pairings;

(d) matching the numeric string as decoded at the computer means with a piece of information that has been previously stored therein and is to be transmitted to the telephone instrument; and

(e) synthesizing said piece of information in voice form and transmitting it to the receiver of the instrument.

4,649,564

ACOUSTIC SYSTEMS

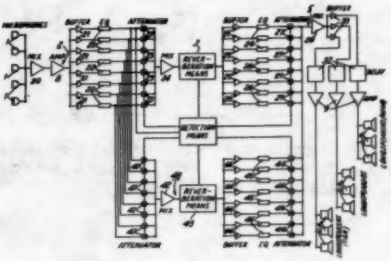
Peter W. Barnett, 73 Woodland Drive, Watford, Hertfordshire, England

Filed Feb. 8, 1985, Ser. No. 699,903

Claims priority, application United Kingdom, Feb. 10, 1984, 8403509

Int. Cl.[4] H03G *3/00*

U.S. Cl. 381—63 17 Claims



1. An acoustic sytem including at least one input transducer perceptive to a sound field, said input transducer connected by a first severable path to the input of reverberation means for producing reverberation having a predetermined decay rate for the sound field perceived by said input transducer at least one output transducer connected by a second severable path to the output of the reverberation means, and detection means which analyses the status of the sound field or any discrete frequency domain within the sound field and which operates both to connect the input transducer over the first path to the reverberation means and to sever connection of the reverberation means to the output transducer over the second path when the status of the sound field or the discrete frequency domain is analysed by the detection means as either rising or constant and, conversely, both to sever the connection of the input transducer over the first path to the reverberation means and to connect the reverberation means to the output transducer over the second path when the status of the sound field or the discrete frequency domain is analysed by the detection means as falling.

4,649,565

ELECTRO-ACOUSTIC CONVERTER WITH COMPENSATED FREQUENCY RESPONSE CHARACTERISTIC

Adrianus J. M. Kaizer; Frederik L. J. Sangster, and Cornelis A. M. Wesche, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 524,638, Aug. 19, 1983, abandoned. This application Nov. 5, 1984, Ser. No. 668,533

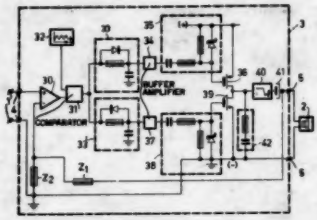
Claims priority, application Netherlands, Sep. 2, 1982, 8203428

Int. Cl.[4] H04R *3/04, 1/02;* H03F *3/217*

U.S. Cl. 381—90 17 Claims

1. A device for converting an electric signal into an acoustic signal comprising, an input terminal for receiving an electric input signal, an electro-acoustic transducer unit, and an amplifier circuit for driving the electro-acoustic transducer unit, said amplifier circuit having an input coupled to the input terminal and an output coupled to the electro-acoustic transducer unit, the electro-acoustic transducer unit having a quality factor less than unity, the amplifier circuit having a frequency dependent gain factor with a frequency response characteristic which rolls off in a frequency range betwen a first frequency, which is substantially equal to the resonant frequency of the transducer unit, and a second frequency which lies above the first frequency, said roll-off being substantially the inverse of the shape of the frequency-response characteristic of the trans-

ducer unit in said frequency range, characterized in that the amplifier circuit exhibits, an electrical efficiency which is higher than that of a conventional class B amplifier having a



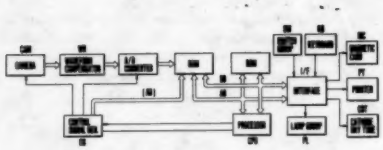
fixed supply voltage in at least a sub-region lying in a region of low drive levels, wherein the sub-region lies at higher drive levels in the said region of low drive levels.

4,649,566

METHOD AND SYSTEM FOR PROCESSING IMAGE SIGNALS

Teruo Tsunoda, Chiba, and Ryoichi Kokawa, Nara, both of Japan, assignors to Komori Printing Machinery Co., Ltd., Japan

Filed Dec. 8, 1982, Ser. No. 447,749
Claims priority, application Japan, May 19, 1982, 57-84545
Int. Cl.[4] G06K 9/00
U.S. Cl. 382—1 **1 Claim**



1. A method of proofing an image signal for use in an image area measuring apparatus of the type wherein an image bearing area of a lithographic printing plate is photographed with a television camera to produce image signals, the image signals being converted into digital signals to obtain measured value data and an image area of each one of a plurality of zones formed by dividing said image bearing area is determined by an arithmetic operation utilizing the measured value data, said method comprising the steps of:

photographing a proof plate having a uniform reflectivity with a television camera to produce proof image signals;

converting said proof image signals to digital signals to generate proof measured value data;

addressing a compensation table with each value of said proof measured value data to produce proof data;

addressing said compensation table with the measured value data obtained from photographing said image bearing area of said lithographic plate with said television camera to produce compensated data;

subtracting said proof data from said compensated data to obtain difference data; and

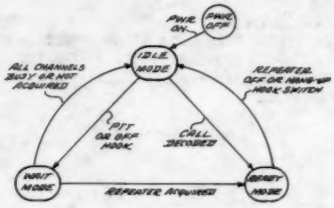
addressing an image area conversion table with said difference data to determine said image area of said photographed lithographic plate.

4,649,567

DISPATCH OVERDIALING FOR INTER-GROUP AND OTHER ADDED CALLING/CALLED ACCESS TO COMMUNICATIONS CHANNELS IN A TRUNKED RADIO COMMUNICATIONS SYSTEM

Jeffrey S. Childress, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Apr. 22, 1985, Ser. No. 725,682
Int. Cl.[4] H04Q 7/00, 9/00
U.S. Cl. 455—17 **35 Claims**



1. In an improved trunking radio transceiver of the type which (a) in an idle mode scans plural channels to detect a pre-assigned calling sequence of N received signals, (b) in a wait mode scans said plural channels to detect and acquire a non-used one of said channels and (c) in a ready mode stays tuned to such detected calling or acquired channel C so as to permit transceiver communications thereon, said improvement comprising:

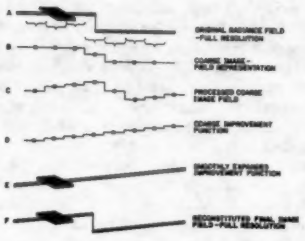
transmitter means operable after initial acquisition of said channel C for (1) sending over said channel C a predetermined dispatch overdial signal to initiate an attempt to add yet another transceiver to an existing communication, (2) thereafter sending over said channel C a sequence of N identifying signals which were used to establish said transmitter means on said channel C, and (3) thereafter sending over said channel C another sequence of signals identifying said another transceiver.

4,649,568

RECONSTITUTION OF IMAGES

Kenneth C. Kiesel, Wayland, and William R. Wray, Winchester, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 22, 1984, Ser. No. 663,719
Int. Cl.[4] G06K 9/36
U.S. Cl. 382—41 **10 Claims**



1. An image improvement method comprising the steps of

determining a radiance field representative of a comparatively fine resolution image-wise distribution of radiation from an original scene, and

determining an improved image field by modifying said radiance field with an improvement function derived from the processing of a regular array of light values of a com-

paratively coarse resolution representation of said original scene.

4,649,569

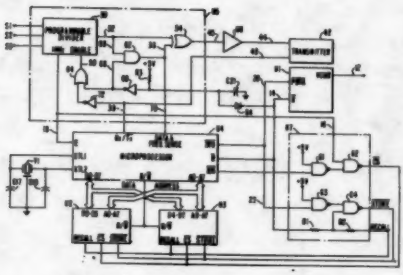
TRANSCEIVER WITH AUTO FREQUENCY SENSE

Jerry M. Kennon; James V. Faulkner, Jr., and Theodore H. York, all of Raleigh, N.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 31, 1984, Ser. No. 615,867

Int. Cl.[4] H04B *17/00*; G01R *23/14*

U.S. Cl. 455—67 **4 Claims**



1. A transceiver, comprising: means for transmitting a modulated signal, said modulated signal being a carrier signal having a first frequency modulated with a base band data message;

first means for generating said carrier signal, said first generating means being connected in signal communication with said transmitting means;

a microprocessor having an input connected to an output of said first generating means comprising second means for generating an input signal upon the occurrence of a preselected edge of said carrier signal, said second generating means being connected in signal communication with said first generating means;

said microprocessor further comprising means for logging elapsed time, said logging means being responsive to a second frequency, said second frequency being higher than said first frequency, said logging means comprising a means for counting pulses of said second frequency and storing a representation of an accumulated value of said pulses, each of said pulses being representative of a preselected period of time;

said microprocessor further comprising means for comparing two values of said accumulated value representation of said elapsed time to determine an interval between two of said occurrences of said preselected edge of said carrier signal, said comparing means being connected in signal communication with said logging means; and

means for storing said interval.

4,649,570

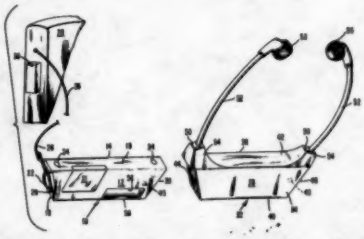
HEADSET RECEIVER CARTRIDGE AND EARPHONE CASE THEREFOR

William H. Terbrack, Irvine; Harvey F. Brion, Mission Viejo, and Ronald J. Minear, Huntington Beach, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 717,587, Mar. 29, 1985, abandoned, which is a continuation of Ser. No. 607,715, May 7, 1984, abandoned, which is a continuation of Ser. No. 354,120, Mar. 2, 1982, abandoned. This application May 23, 1986, Ser. No. 868,880

Int. Cl.[4] H04B *1/08*

U.S. Cl. 455—344 **22 Claims**



22. Apparatus for enabling a headset receiver with receiver control means to be reused in a sanitary manner, comprising:

a case for supporting the receiver; and

means associated with the case for enabling the information from the receiver to be transmitted to a listener's ears and for permitting access to the control means, said information enabling means including means for enabling support of the case and the receiver by the listener's ears,

said case having a configuration which permits its replacement after its use with a sanitized case.

DESIGN PATENTS

GRANTED MAR. 10, 1987

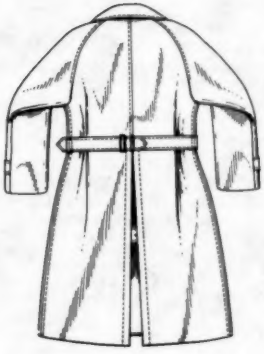
ERRATA

For CLASS	See PATENT NO.
D14-058	288,659
D10-114	288,676
D28-048	288,718

DESIGNS

MARCH 10, 1987

288,620
GARMENT
John K. Waldron, St. Albans, England, assignor to Burberrys Limited, United Kingdom
Filed Jul. 9, 1984, Ser. No. 629,208
Claims priority, application United Kingdom, Jan. 17, 1984, 1,017,365
Term of patent 14 years
U.S. Cl. D2—203

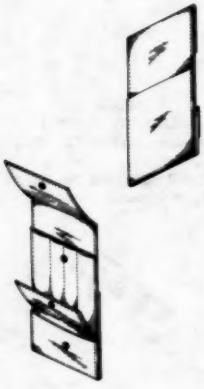


288,621
ATHLETIC SHOE INSOLE
Vijay Surpuriya, Memphis, Tenn., and Charles J. Gudas, Hinsdale, Ill., assignors to Scholl, Inc., Memphis, Tenn.
Filed May 4, 1984, Ser. No. 607,322
Term of patent 14 years
U.S. Cl. D2—318

288,622
NEEDLE THREADER
Arnoldus Biemans, Mathenesserlaan 432, 3023 Hg Rotterdam, Netherlands
Filed Nov. 2, 1984, Ser. No. 667,571
Term of patent 14 years
U.S. Cl. D3—28

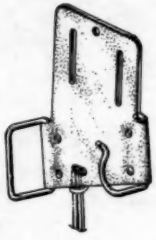
288,623
SUITCASE
Rinaldo Valaguzza, Monza, Italy, assignor to Valaguzza S.p.A., Milan, Italy
Filed Jul. 31, 1984, Ser. No. 636,137
Claims priority, application Italy, Feb. 22, 1984, 20951B/84
Term of patent 14 years
U.S. Cl. D3—71

288,624
PEN AND PENCIL HOLDER WITH POCKETS
Ann Hoard, 5221 Big Bend Dr., Dayton, Ohio 45427
Filed Jul. 11, 1984, Ser. No. 629,779
Term of patent 14 years
U.S. Cl. D3—74



288,625
SATCHEL
Makio Hasuike, Via Mario Donati, 8, Milan, Italy
Filed Jun. 15, 1984, Ser. No. 620,882
Claims priority, application Italy, Jan. 19, 1984, 20575/84[U]
Term of patent 14 years
U.S. Cl. D3—76

288,626
FISHING ROD HOLSTER
Louis A. Webber, 4558 Rueda St., San Diego, Calif. 92124
Filed Jun. 4, 1984, Ser. No. 617,046
Term of patent 14 years
U.S. Cl. D3—100

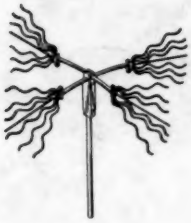


288,627

FIREPLACE SMOKE CHAMBER BRUSH OR THE LIKE

Sherman D. Rennels, 3636 NW. 20th, Oklahoma City, Okla. 73107

Filed Oct. 15, 1984, Ser. No. 660,740
Term of patent 14 years
U.S. Cl. D4—119

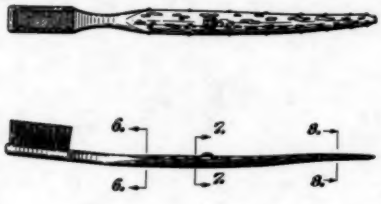


288,628

TOOTHBRUSH

Rosemary Farrand, 14201 E. 59th, Kansas City, Mo. 64136

Filed Oct. 25, 1984, Ser. No. 664,856
Term of patent 14 years
U.S. Cl. D4—104



288,629

CHAIR CONTROL RELEASE AND LOCKING CAM FOR TILTABLE CHAIRS

Frank Doerner, 138 Aberdeen Road, Kitchener, Ontario, Canada N2M 2Y7

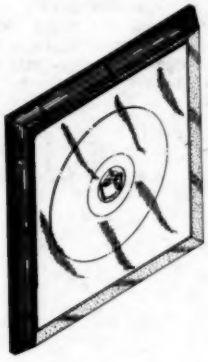
Filed Jan. 14, 1985, Ser. No. 691,516
Claims priority, application Canada, Oct. 17, 1984, 17-10-84-12
Term of patent 14 years
U.S. Cl. D6—500

288,630

PHONOGRAPH RECORD DISPLAY FRAME OR SIMILAR ARTICLE

Brian A. Haugen, 702 W. Court St., Lot 37, Belle Plaine, Minn. 56011

Filed May 16, 1984, Ser. No. 610,824
Term of patent 14 years
U.S. Cl. D6—300



288,631
COMBINED SEAT AND STORAGE UNIT
David J. Mample, 8247 89th St. North, Mahtomedi, Minn. 55115
Filed Aug. 16, 1984, Ser. No. 641,567
Term of patent 14 years
U.S. Cl. D6—336

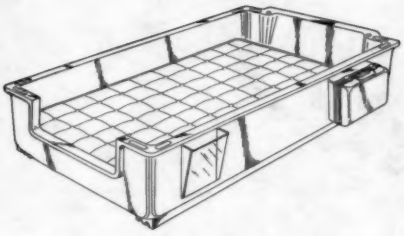
288,632
LOUNGE SEAT
Tone Grimsrud, Oddenveien 13A, N-1322 Hovik, Norway
Filed Oct. 29, 1984, Ser. No. 665,766
Claims priority, application Norway, May 2, 1984, 65164
Term of patent 14 years
U.S. Cl. D6—360

288,633
ADJUSTABLE CHAIR
Paul R. Goldman, Andover, Mass., assignor to Plycraft Inc., Lawrence, Mass.
Filed Sep. 24, 1984, Ser. No. 653,327
Term of patent 14 years
U.S. Cl. D6—367

288,634
LOUNGE CHAIR
L. David Williams, 1530 Taylor, Eugene, Oreg. 97402
Filed Sep. 7, 1984, Ser. No. 648,329
Term of patent 14 years
U.S. Cl. D6—372

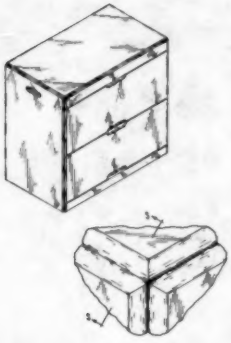
288,635
CHAIR
Antonio A. Vidal, Camino Can Bros, 5, Martorell, Barcelona, Spain
Filed May 24, 1984, Ser. No. 613,277
Claims priority, application Spain, Mar. 13, 1984, 105,735
Term of patent 14 years
U.S. Cl. D6—379

288,636
PORTABLE BED
Charles L. McLaren, P.O. Box 55288, Houston, Tex. 77055
Filed May 9, 1983, Ser. No. 492,581
Term of patent 14 years
U.S. Cl. D6—383

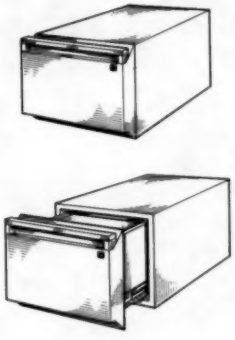


288,637
MOBILE TABLE
Robert C. Winzeler, III, Montpelier, Ohio, assignor to Design Institute America, Inc., Montpelier, Ohio
Filed Jun. 18, 1984, Ser. No. 621,604
Term of patent 14 years
U.S. Cl. D6—429

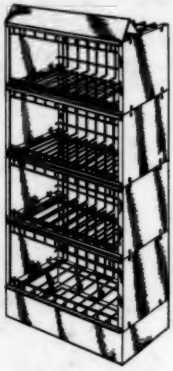
288,638
CABINET
Jane L. Jones, Jasper, Ind., assignor to Kimball International, Inc., Jasper, Ind.
Filed Jun. 6, 1984, Ser. No. 617,685
Term of patent 14 years
U.S. Cl. D6—446



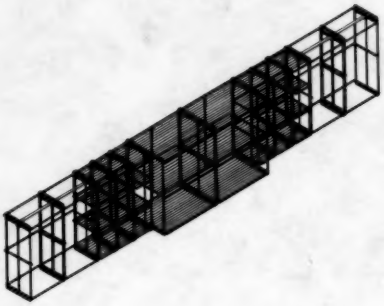
288,639
FILE CABINET
Inga-Lisa Johansson, Töreboda, Sweden, assignor to Industri AB Dahlstedt & Johansson, Toreboda, Sweden
Filed Oct. 26, 1984, Ser. No. 665,202
Claims priority, application Sweden, Apr. 26, 1984, 84-1347
Term of patent 14 years
U.S. Cl. D6—448

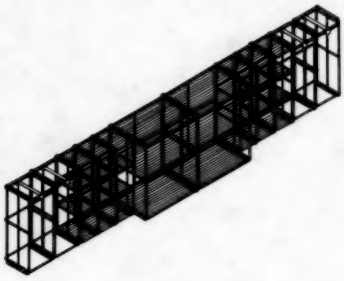


288,640
MODULAR MERCHANDIZING RACK UNIT
Duncan F. Campbell, 73 Chilton Road, Toronto, Ontario, Canada M4J 3C7
Filed Oct. 29, 1984, Ser. No. 666,284
Term of patent 14 years
U.S. Cl. D6—465

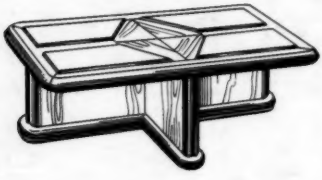


288,641
MODULAR DISPLAY UNIT
Melvin E. Kester, Concord, N.C., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed Aug. 30, 1984, Ser. No. 646,360
Term of patent 14 years
U.S. Cl. D6—465

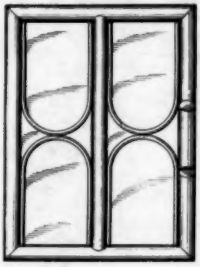




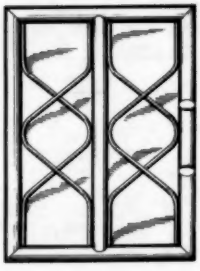
288,642
TABLE
Hector A. DeLuca, Woodland Hills, Calif., assignor to Schnadig Corporation, Chicago, Ill.
Filed May 1, 1986, Ser. No. 858,502
Term of patent 14 years
U.S. Cl. D6—480



288,643
CABINET PANEL
Robert R. Rosario, Calle 18 EE-9, Alturas de Flamboyan, and Luis G. C. Bruno, Calle 16 AA1, Alturas de Flamboyan, Bayamon, both of P.R. 00619, assignors to Robert Rosario Rosario, Alturas de Flamboyan; Luis German Cacho Bruno, Bayamon and Interspace Industries Corp., Caguas, all of P.R.
Filed Sep. 26, 1984, Ser. No. 655,124
Term of patent 14 years
U.S. Cl. D6—492

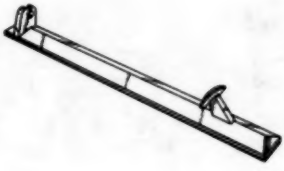


288,644
CABINET PANEL
Robert R. Rosario, Calle 18 EE-9, Alturas de Flamboyan, and Luis G. C. Bruno, Calle 16 AA1, Alturas de Flamboyan, Bayamon, both of P.R. 00619, assignors to Robert Rosario Rosario, Alturas de Flamboyan; Luis German Cacho Bruno, Bayamon and Interspace Industries Corp., Caguas, all of P.R.
Filed Sep. 26, 1984, Ser. No. 655,131
Term of patent 14 years
U.S. Cl. D6—492

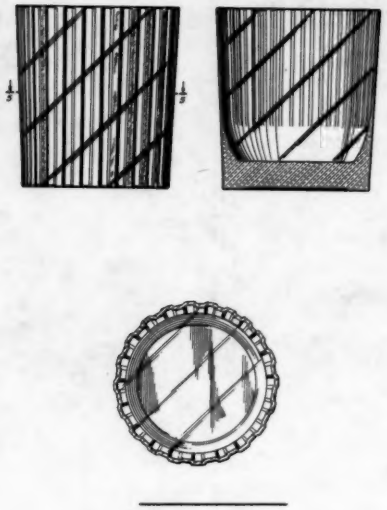


288,645
CLOSET ROD SUPPORT
Frank P. Campbell, 13463 W. 78th Pl., Arvada, Colo. 80005
Division of Ser. No. 398,573, Jul. 15, 1982, Pat. No. D. 277,349, which is a continuation-in-part of Ser. No. 139,660, Apr. 14, 1980, abandoned. This application Oct. 15, 1984, Ser. No. 660,788
Term of patent 14 years
U.S. Cl. D6—513

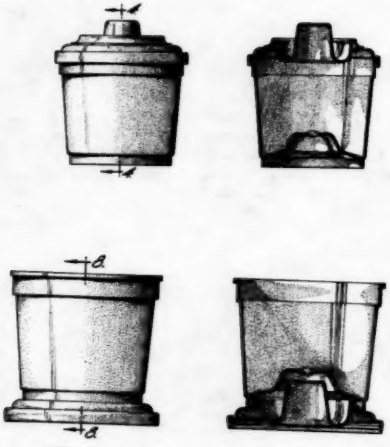
288,646
FITTING FOR VENETIAN BLINDS
Evert Christoffersson, Stenbrunnsvägen 11, Malmö, Sweden
Filed Apr. 19, 1984, Ser. No. 601,996
Claims priority, application Sweden, Oct. 19, 1983, 83-2690
Term of patent 14 years
U.S. Cl. D6—580



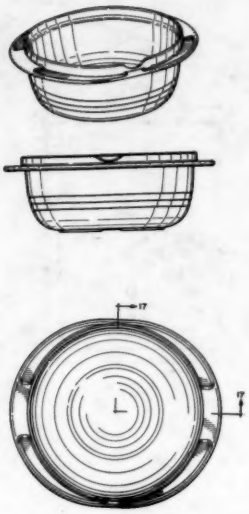
288,647
TUMBLER OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute 62510, Arques, France
Filed Sep. 11, 1984, Ser. No. 649,419
Term of patent 14 years
U.S. Cl. D7—14



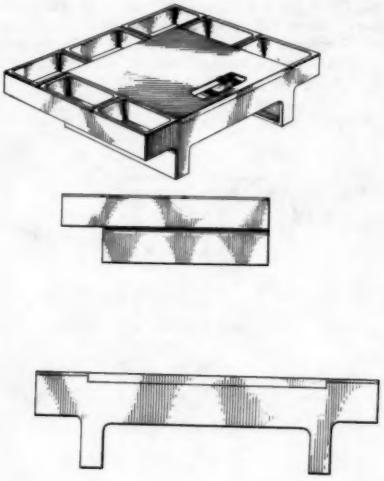
288,648
FOOD CONTAINER
Carey M. Monaghan, Northville, Mich., assignor to Campbell Soup Company, Camden, N.J.
Filed Sep. 10, 1984, Ser. No. 648,832
Term of patent 14 years
U.S. Cl. D7—17



288,649
CASSEROLE DISH OR THE LIKE
Robert H. C. M. Daenen, Hekelgem; Pieter K. J. DeCoster, Aalst, both of Belgium, and Martin J. Wolff, North Providence, R.I., assignors to Dart Industries Inc., Northbrook, Ill.
Filed Aug. 3, 1984, Ser. No. 637,677
Term of patent 14 years
U.S. Cl. D7—20

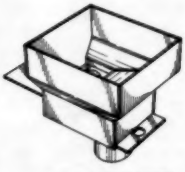


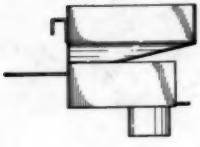
288,650
COMBINED CUTTING BOARD, SERVING DISHES AND SUPPORT STAND
Jeffrey Mintz, 51 Blake Rd., Lexington, Mass. 02173
Filed Nov. 27, 1984, Ser. No. 675,437
Term of patent 14 years
U.S. Cl. D7—46



288,651
FUNNEL APPARATUS FOR FILLING HOLLOWED SANDWICH ROLLS
Paul Rimmeir, The Claridge, 201 S. 18th St., Apartment 2219, Philadelphia, Pa. 19103
Filed May 24, 1984, Ser. No. 613,856
Term of patent 14 years
U.S. Cl. D7—68

288,652
COMBINED CANDY HOPPER AND DISPENSER
Robert R. Snediker, Sr., Winnetka, and Robert R. Snediker, Jr., Buffalo Grove, both of Ill., assignors to Chicago Show Printing Co., Morton Grove, Ill.
Filed Aug. 23, 1984, Ser. No. 643,466
Term of patent 14 years
U.S. Cl. D7—68

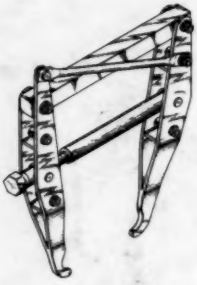




288,653
GOLF BAG BEVERAGE COOLER
Marion C. Crymes, 6321 Lawrenceville Hwy., Tucker, Ga. 30084
Filed Mar. 26, 1984, Ser. No. 593,385
Term of patent 14 years
U.S. Cl. D7—77

288,654
CARAFE OR THE LIKE
Octavio Niisse, Munster, Fed. Rep. of Germany, assignor to Melitta, Inc., Cherry Hill, N.J.
Filed Sep. 17, 1984, Ser. No. 651,288
Term of patent 14 years
U.S. Cl. D7—317

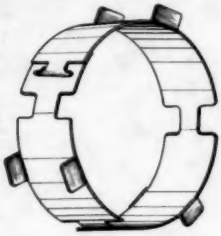
288,655
ROLLER CHAIN TOOL
George Hamatani, Rte. 1, Box 400, Clarksburg, Calif. 95612
Filed Oct. 22, 1984, Ser. No. 663,642
Term of patent 14 years
U.S. Cl. D8—72



288,656
TORQUE APPLYING HAND TOOL
Lloyd T. Smith, 715 W. Broadway, Newton, Kans. 67114
Filed Jun. 28, 1984, Ser. No. 625,642
Term of patent 14 years
U.S. Cl. D8—82

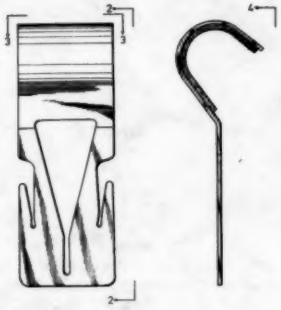
288,657
KNIFE SHARPENER
Erkki O. Linden, Billnas, Finland, assignor to Oy Fiskars AB, Helsinki, Finland
Filed Jul. 19, 1984, Ser. No. 632,547
Claims priority, application Finland, Apr. 3, 1984, 359/84
Term of patent 14 years
U.S. Cl. D8—93

288,658
LINER FOR WIRE COILS OR THE LIKE
Richard M. Lefever, York County, Pa., assignor to Teledyne Industries, Inc., Los Angeles, Calif.
Filed Dec. 7, 1984, Ser. No. 679,479
Term of patent 14 years
U.S. Cl. D8—358

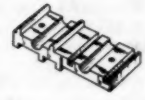


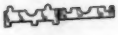
288,659
TELEPHONE STATION SET
Masanori Suzuki, Tokyo, Japan, assignor to TIE/Communications, Inc., Shelton, Conn.
Filed Nov. 15, 1984, Ser. No. 671,586
Term of patent 14 years
U.S. Cl. D14—58

288,660
ANIMAL SKINNING HOLDER
Doyle R. Hudson, 2403 N. 8th St., West Monroe, La. 71291
Filed Apr. 25, 1985, Ser. No. 727,016
Term of patent 14 years
U.S. Cl. D8—373



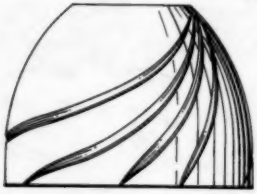
288,661
CABLE MOUNTING BLOCK
Stephen N. Sharpe, Ewing Township, Mercer County, N.J., assignor to The Idea Works, Inc., West Milford, N.J.
Filed Jun. 21, 1985, Ser. No. 747,254
Term of patent 14 years
U.S. Cl. D8—396





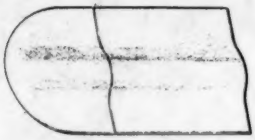
288,662
METERING BOTTLE
Walter R. Obuchowski, Ridgefield, Conn., assignor to Charter Supply Company, Inc., Philmont, N.Y.
Filed Sep. 28, 1984, Ser. No. 655,714
Term of patent 14 years
U.S. Cl. D9—337

288,663
CAP FOR A CONTAINER
Francois Thieffry, Paris, France, assignor to Societe d'Etudes de Chimie et de Therapie Appliquees-Laboratoires de Cosmetologie Yves Rocher-S.E.C.T.A., France
Filed Aug. 14, 1984, Ser. No. 640,612
Term of patent 14 years
U.S. Cl. D9—452

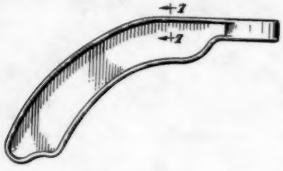


288,664
BOTTLE OR SIMILAR ARTICLE
Hermann H. Rohrer, Terrassenweg 69, Münsingen, Switzerland CH-3110
Filed May 29, 1984, Ser. No. 615,011
Claims priority, application Switzerland, Nov. 30, 1983, 113386
Term of patent 14 years
U.S. Cl. D9—374

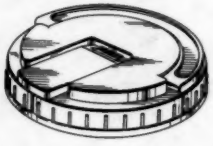
288,665
BOTTLE
Christian Broutin, La Roche Guyon, France, assignor to Thomas Lawrence S.A., Lagny, France
Filed Dec. 6, 1983, Ser. No. 558,627
Claims priority, application France, Jun. 6, 1983, 83 2106
Term of patent 14 years
U.S. Cl. D9—377



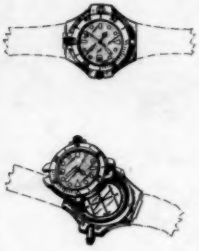
288,666
HANDLE FOR A CONTAINER OR SIMILAR ARTICLE
Philip L. Brun, 7133 Troy Crest Ct., Dayton, Ohio 45424
Filed Aug. 31, 1984, Ser. No. 645,825
Term of patent 14 years
U.S. Cl. D9—434



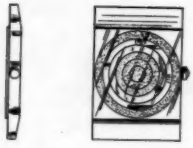
288,667
CONTAINER CLOSURE
Odin F. Miner, Lenexa, Kans., assignor to Miner Container Printing, Inc., Lenexa, Kans.
Filed Jul. 11, 1984, Ser. No. 629,893
Term of patent 14 years
U.S. Cl. D9—443



288,668
TOP CASING FOR A WRISTWATCH PLUS COMPASS
Armand Flury, Bienne, Switzerland, assignor to Candino Watch Co. AG, Switzerland
Filed Mar. 27, 1984, Ser. No. 593,957
Claims priority, application Hague, Sep. 27, 1983, 73 491
Term of patent 14 years
U.S. Cl. D10—31

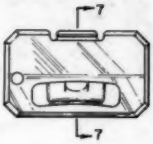


288,669
WRIST WATCH
Jeffrey Maron, 248 Lafayette St., New York, N.Y. 10012
Filed Mar. 2, 1984, Ser. No. 585,508
Term of patent 14 years
U.S. Cl. D10—30



288,670
COMBINED THERMOSTAT AND MAGNIFIER THEREFOR
Gerald R. Steiner, 3660 Independence Ave. South #32, St. Louis Park, Minn. 55426
Filed Jun. 4, 1984, Ser. No. 616,571
Term of patent 14 years
U.S. Cl. D10—50

288,671
LINE LEVEL
Gregory L. Cross, and Wendell C. Cross, both of 11413 W. 48th Ave., Wheat Ridge, Colo. 80033
Filed Apr. 9, 1984, Ser. No. 598,218
Term of patent 14 years
U.S. Cl. D10—69

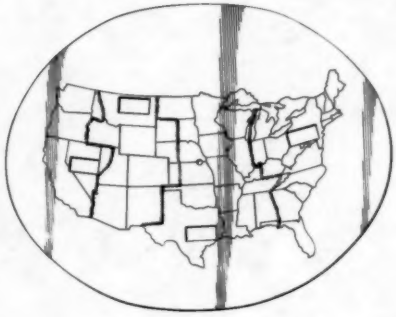


288,672
SCALE
Gerhard Gohl, Stuttgart, Fed. Rep. of Germany, assignor to Jakob Maul GmbH, Bad-König-Zell, Fed. Rep. of Germany
Filed Apr. 26, 1984, Ser. No. 604,108
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1983, MR 786
Term of patent 14 years
U.S. Cl. D10—91

288,673
WATER METER
George J. Nolte, Longwood, Fla., assignor to Precision Meters, Inc., Orlando, Fla.
Filed May 29, 1984, Ser. No. 614,830
Term of patent 14 years
U.S. Cl. D10—99

288,674
REFLECTIVE SIGNAL FOR VELOCIPEDES
James Vezendy, Rolling Acres, Godfrey, Ontario, Canada K0H-1T0
Filed Apr. 15, 1985, Ser. No. 723,351
Term of patent 14 years
U.S. Cl. D10—111

288,675
CLOCK FACE
Jong S. Lee, 800 Forest Ave., Westfield, N.J. 07090
Filed Jul. 23, 1984, Ser. No. 633,710
Term of patent 14 years
U.S. Cl. D11—126

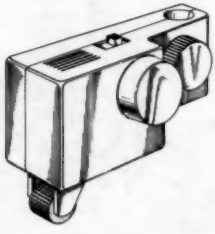


288,676
ILLUMINATED LEGEND INDICATOR
Alan Dewhurst, Hounslow, England, assignor to Dewhurst & Partner p.l.c., Hounslow, England
Filed Apr. 5, 1984, Ser. No. 597,063
Term of patent 14 years
U.S. Cl. D10—114

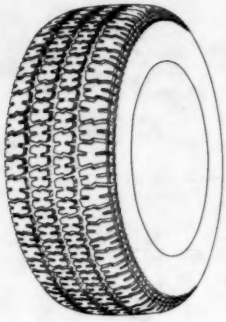
288,677
HANGING ORNAMENT
Edward A. Nieuhuis, 2088 Harvest Drive, Mississauga, Ontario, Canada L4Y 1T6
Filed Feb. 6, 1984, Ser. No. 577,237
Claims priority, application Canada, Aug. 18, 1983, 18-08-83-8
Term of patent 14 years
U.S. Cl. D11—133

288,678
COLLAPSIBLE STROLLER
Ramon Jane, Cartagena 203, 08013 Barcelona, Spain
Filed Dec. 14, 1984, Ser. No. 681,624
Claims priority, application Spain, Jun. 27, 1984, 106379
Term of patent 14 years
U.S. Cl. D12—129

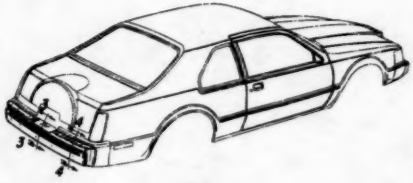
288,679
DEVICE FOR IMPARTING ROCKING MOTION TO INFANT STROLLER
Jeffrey M. Moskin, 3106 Barry Ave., Los Angeles, Calif. 90066, and Keith J. Wertz, 2533 S. Deegan, Santa Ana, Calif. 92704
Filed Jul. 9, 1984, Ser. No. 628,787
Term of patent 14 years
U.S. Cl. D12—133



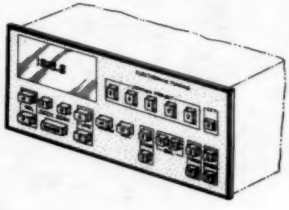
288,680
TIRE
Bill J. Wallet, Marshallville, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio
Filed Nov. 19, 1984, Ser. No. 673,065
Term of patent 14 years
U.S. Cl. D12—147



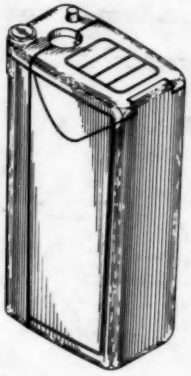
288,681
AUTOMOBILE REAR BUMPER
John J. Telnack, Grosse Ile, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Mar. 15, 1984, Ser. No. 589,785
Term of patent 14 years
U.S. Cl. D12—169



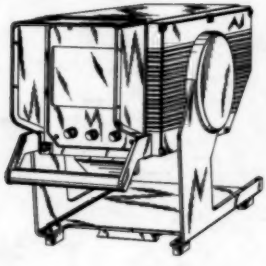
288,682
RADIO CONTROL UNIT
Walter K. Gierschick, West Bloomfield, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Jul. 6, 1984, Ser. No. 628,530
Term of patent 14 years
U.S. Cl. D14—76



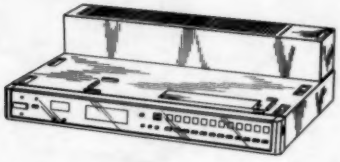
288,683
VEHICULAR COMMUNICATIONS CONVERTER OR SIMILAR ARTICLE
Ralph H. Bostler, Schaumburg, and Albert L. Nagele, Wilmette, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 3, 1984, Ser. No. 637,442
Term of patent 14 years
U.S. Cl. D14—76



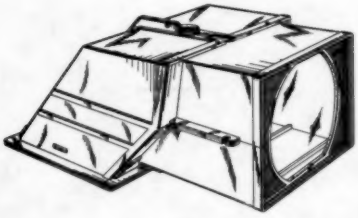
288,684
VIEWFINDER FOR VIDEO CAMERA OR THE LIKE
Haruyuki Enomoto, Yamato, and Naokazu Shimazaki, Oiso, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Aug. 23, 1984, Ser. No. 643,492
Claims priority, application Japan, Feb. 29, 1984, 59-7490
Term of patent 14 years
U.S. Cl. D14—78



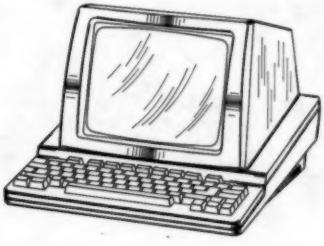
288,685
TV TUNER FOR VIDEO TAPE RECORDER
Noriyuki Arai, and Masaki Takemoto, both of Ehime, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Nov. 28, 1984, Ser. No. 675,573
Claims priority, application Japan, May 29, 1984, 59-21803
Term of patent 14 years
U.S. Cl. D14—84



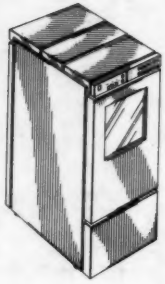
288,686
TELEVISION MAGNIFICATION UNIT
Steven Goodman, 85 Oak St., Norwood, N.J. 07648
Filed Dec. 31, 1985, Ser. No. 815,079
Term of patent 14 years
U.S. Cl. D14—84



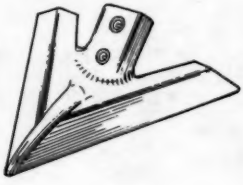
288,687
COMPUTER TERMINAL
Paul D. Major, Emeryville, Calif., assignor to Televideo Systems, Inc., Sunnyvale, Calif.
Filed Jun. 14, 1984, Ser. No. 620,608
Term of patent 14 years
U.S. Cl. D14—106



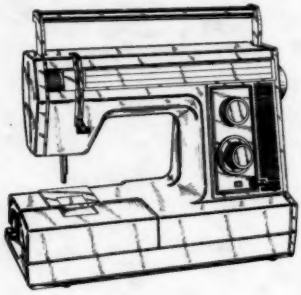
288,688
TAPE DRIVE
Roland Zapfe, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 24, 1984, Ser. No. 654,064
Term of patent 14 years
U.S. Cl. D14—108



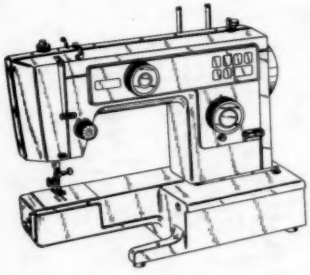
288,689
AGRICULTURAL SWEEP
William M. Johnson, Winchelsea, Australia, assignor to Ralph McKay Limited, Maidstone, Australia
Filed Jul. 19, 1983, Ser. No. 515,376
Term of patent 14 years
U.S. Cl. D15—29



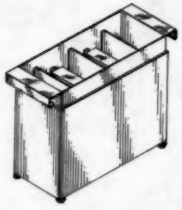
288,690
SEWING MACHINE
Koji Uchida, Hachioji, and Nobufusa Kuroki, Machida, both of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed Feb. 13, 1984, Ser. No. 579,857
Claims priority, application Japan, Dec. 27, 1983, 58-55783
Term of patent 14 years
U.S. Cl. D15—69



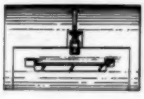
288,691
SEWING MACHINE
Masatomo Amemiya, Hachioji, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan
Filed Feb. 27, 1984, Ser. No. 584,094
Term of patent 14 years
U.S. Cl. D15—69

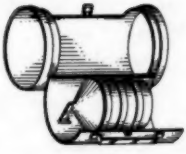


288,692
COOLANT FILTER
Robert T. Wysolmierski, P.O. Box 228, Brookline, N.H. 03033
Filed Jul. 20, 1984, Ser. No. 633,036
Term of patent 14 years
U.S. Cl. D15—147



288,693
MAGNETIC CIRCULAR SEPARATOR
Robert T. Wysolmierski, P.O. Box 228, Brookline, N.H. 03033
Filed Jul. 20, 1984, Ser. No. 633,041
Term of patent 14 years
U.S. Cl. D15—147

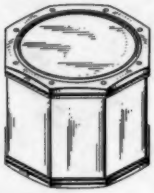




288,694
COMBINED CLUTCH DRUM AND RING PINION
Gunther H. W. Dobbertin, Mölndal, Sweden, assignor to AB Electrolux, Stockholm, Sweden
Filed Jul. 16, 1984, Ser. No. 631,394
Claims priority, application Sweden, Jan. 27, 1984, 840268
Term of patent 14 years
U.S. Cl. D15—148

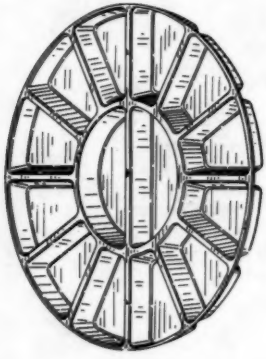
288,695
BASS GUITAR
Ned Steinberger, Cornwall, N.Y., assignor to Steinberger Design, Newburgh, N.Y.
Filed Jul. 3, 1984, Ser. No. 627,646
Term of patent 14 years
U.S. Cl. D17—14

288,696
DRUM
Yoshihiro Hoshino, Nagoya, Japan, assignor to Hoshino Gakki Co., Ltd., Japan
Filed Sep. 4, 1984, Ser. No. 646,710
Claims priority, application Japan, Apr. 11, 1984, 59-014716
Term of patent 14 years
U.S. Cl. D17—22

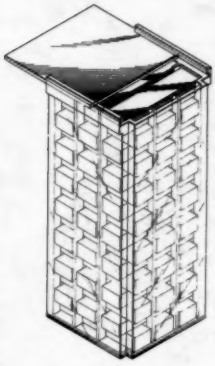


288,697
GAME BOARD OR THE LIKE
Brian L. Newton, Woonsocket, R.I.; George W. Ptaszek, Franklin Lakes, N.J., and Mark P. Zieff, Lexington, Mass., assignors to Dart Industries Inc., Northbrook, Ill.
Filed Aug. 3, 1984, Ser. No. 637,676
Term of patent 14 years
U.S. Cl. D21—17

288,698
GAME BOARD
David Finnamore, 624 Mount Pleasant Rd., Toronto, Ontario, Canada M4S 2M8
Filed Sep. 4, 1984, Ser. No. 646,470
Claims priority, application Canada, Jun. 8, 1984, 08068414
Term of patent 14 years
U.S. Cl. D21—17



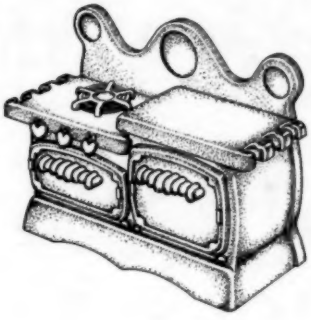
288,699
COMBINED HOLDING RACK AND GAME PIECES THEREFOR
Richard A. Dunn, Jr., 27 Hromiak Ter., West Paterson, N.J. 07424
Filed Aug. 16, 1984, Ser. No. 641,328
Term of patent 14 years
U.S. Cl. D21—54



288,700
KALEIDOSCOPE
David Kalish, 808 Post St., Suite 100, San Francisco, Calif. 94109
Filed May 3, 1984, Ser. No. 606,896
Term of patent 14 years
U.S. Cl. D21—60

288,701
MODEL CHURCH
Hugh F. J. Behan, Box 1107-609 Clark, Jefferson City, Mo. 65102
Filed Aug. 20, 1984, Ser. No. 642,361
Term of patent 14 years
U.S. Cl. D21—114

288,702
TOY OVEN
Rickie T. Bedell; Michael A. Katauskas, and Thomas P. Osborne, all of Cincinnati, Ohio, assignors to American Greetings Corporation, Cleveland, Ohio
Filed Jul. 19, 1984, Ser. No. 632,494
Term of patent 14 years
U.S. Cl. D21—122



288,703

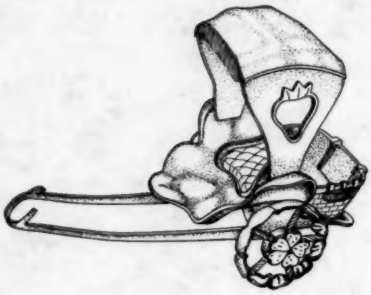
TOY CART

Timothy A. Effler, and Lori A. Petrosky, both of Cincinnati, Ohio, assignors to American Greetings Corporation, Cleveland, Ohio

Filed Jul. 6, 1984, Ser. No. 628,556

Term of patent 14 years

U.S. Cl. D21—134



288,704

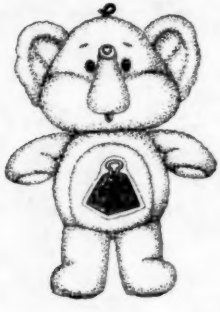
TOY ELEPHANT FIGURE

Ralph Shaffer, Columbia Station; William Davidson, Lakewood, both of Ohio; Elena Kucharik, New Canaan, Conn., and Nanette B. Hardiman, Jersey City, N.J., assignors to American Greetings Corporation, Cleveland, Ohio

Filed Nov. 8, 1984, Ser. No. 669,393

Term of patent 14 years

U.S. Cl. D21—162



288,705

TOY RABBIT FIGURE

Ralph Shaffer, Columbia Station; William Davidson, Lakewood, both of Ohio; Elena Kucharik, New Canaan, Conn.; Nanette B. Hardiman, Jersey City, N.J.; Cathy L. Venesa, Cincinnati, and Andrea McSweeney, Cincinnati, both of Ohio, assignors to American Greetings Corporation, Cleveland, Ohio

Filed Nov. 8, 1984, Ser. No. 669,563

Term of patent 14 years

U.S. Cl. D21—187

288,706

EXERCISE CYCLE

Dan E. Gremonprez, West Bend, Wis., and William C. Cesaroni, Glenview, Ill., assignors to Dart Industries, Inc., Northbrook, Ill.

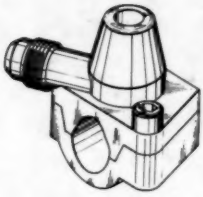
Filed Jan. 29, 1985, Ser. No. 695,976

Term of patent 14 years

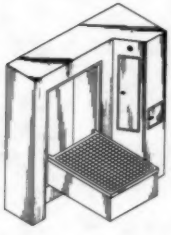
U.S. Cl. D21—194

288,707
WATER PURIFIER
Clement C. Macevicz, San Diego, and Byron J. Mulherin, Jr., San Marcos, both of Calif., assignors to Nimbus Water Systems, Inc., Escondido, Calif.
Filed Jul. 10, 1984, Ser. No. 629,266
Term of patent 14 years
U.S. Cl. D23—4

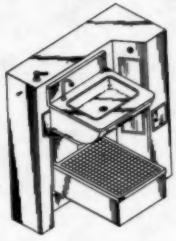
288,708
PIERCING VALVE
Arnold A. Cowan, Encino, Calif., assignor to Gem Products, Inc., Calif.
Filed Nov. 27, 1984, Ser. No. 675,360
Term of patent 14 years
U.S. Cl. D23—19



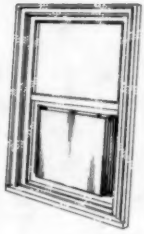
288,709
COMBINED SEAT AND WATER CLOSET
J. Les Campbell, 709 Bethlehem Pike, Philadelphia, Pa. 19118
Filed Oct. 17, 1984, Ser. No. 663,061
Term of patent 14 years
U.S. Cl. D23—49



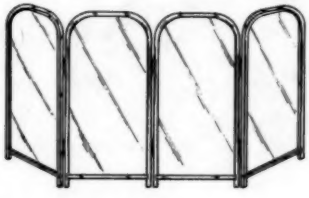
288,710
COMBINED LAVATORY, SEAT AND WATER CLOSET
J. Les Campbell, 709 Bethlehem Pike, Philadelphia, Pa. 19118
Filed Oct. 17, 1984, Ser. No. 661,907
Term of patent 14 years
U.S. Cl. D23—49



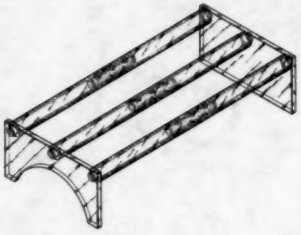
288,711
WINDOW MOUNTED SOLAR HEATER
Donald A. Atkinson, Apt. 222, Valenti Country Estate, Rte. 5, Oneida, N.Y. 13421
Filed Nov. 16, 1984, Ser. No. 671,907
Term of patent 14 years
U.S. Cl. D23—72



288,712
FIREPLACE SCREEN
Joseph J. Catania, Cheshire; Angelo Gaudino, Wallingford; Russell DeTuzzi, Huntington, and Maxwell Gardner, Wallingford, all of Conn., assignors to Century Fireplace Furnishings, Inc., Wallingford, Conn.
Filed Jun. 29, 1984, Ser. No. 626,250
Term of patent 14 years
U.S. Cl. D23—138.3

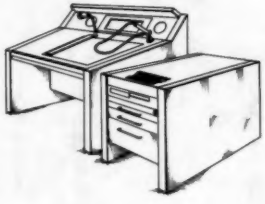


288,713
AIR FRESHENING ATTACHMENT FOR VENTILATION REGISTER OR THE LIKE
Terri L. Darneal, 5623 Kermit La., Stockton, Calif. 95217
Filed Dec. 17, 1984, Ser. No. 682,634
Term of patent 14 years
U.S. Cl. D23—148



288,714
AIR FRESHENER DISPENSER OR SIMILAR ARTICLE
Daniel C. Wilson, Taylors, and William J. Britt, Greenville, both of S.C., assignors to The Dow Chemical Company, Midland, Mich.
Filed Nov. 7, 1984, Ser. No. 669,285
Term of patent 14 years
U.S. Cl. D23—150

288,715
TWO-COMPONENT AUDIOMETER DESK
Ludwig M. Moser, Estenfeld, and Anton Kammermeier, Welden, both of Fed. Rep. of Germany, assignors to Westra Electronic GmbH, Welden, Fed. Rep. of Germany
Filed Aug. 2, 1984, Ser. No. 637,203
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1984, 4280
Term of patent 14 years
U.S. Cl. D24—1.1



288,716
DIAGNOSTIC TEST KIT
Edward F. Covell, Glen Cove, N.Y., and Lovick E. Cannon, III, Wayland, Mass., assignors to Tambrands Inc., Lake Success, N.Y.
Filed Aug. 8, 1984, Ser. No. 638,729
Term of patent 14 years
U.S. Cl. D24—17

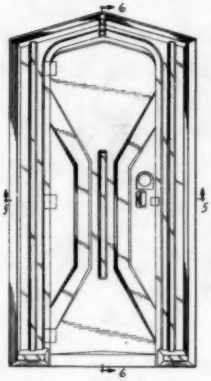
288,717
SPA
Robert V. Willich, and Robert Morrow, both of 870 Wilco Rd., Stayton, Oreg. 97383
Filed Aug. 8, 1984, Ser. No. 638,783
Term of patent 14 years
U.S. Cl. D24—38

288,718

BUILDING DOOR UNIT

Phillip R. Juaire, and Duane T. Tegg, both of Brooklyn Center, Minn., assignors to Satellite Industries, Inc., Minneapolis, Minn.

Filed Sep. 21, 1984, Ser. No. 652,884
Term of patent 14 years
U.S. Cl. D25—48



288,719

MARINE BOARDING STEPLADDER

Karl K. Feist, 2158 Beech Tree Dr., Uniontown, Ohio 44685

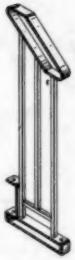
Filed Sep. 12, 1984, Ser. No. 649,688
Term of patent 14 years
U.S. Cl. D25—65

288,720

BRACKET COMPONENT FOR FORMING A STAIRCASE

Harold M. Gould, Sittingbourne, United Kingdom, assignor to Wards Construction (Overseas) Limited, Irish Town, Gibraltar

Filed Feb. 29, 1984, Ser. No. 715,301
Claims priority, application United Kingdom, Sep. 1, 1983, 1014891; Sep. 1, 1983, 1014893
Term of patent 14 years
U.S. Cl. D25—73



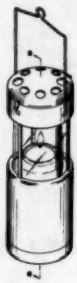
288,721

FLUORESCENT LAMP OR THE LIKE

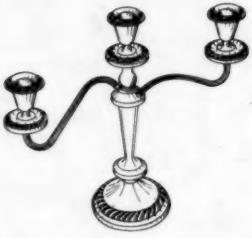
Robert Y. Pai, Hamilton, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Dec. 6, 1984, Ser. No. 678,927
Term of patent 14 years
U.S. Cl. D26—3

288,722
TELESCOPING CANDLE LANTERN
Katsuhiko Harada, Fuchu, Japan, assignor to LEC Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 26, 1984, Ser. No. 624,948
Claims priority, application Japan, Jan. 19, 1984, 59-5642
Term of patent 14 years
U.S. Cl. D26—11

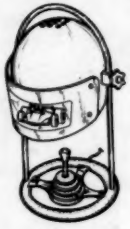


288,723
CANDELABRA
Kwong Y. Liu, Hong Kong, Hong Kong, assignor to Wai Hang Metal & Plastic, Mfy., Kowloon, Hong Kong
Filed Mar. 1, 1984, Ser. No. 585,211
Claims priority, application United Kingdom, Jan. 31, 1984, 1017594
Term of patent 14 years
U.S. Cl. D26—13

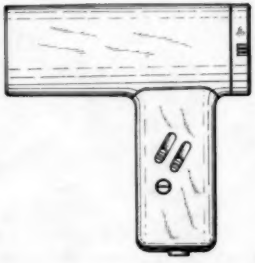


288,724
FLASHLIGHT
Louis Yakubek, Berlin, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Dec. 31, 1984, Ser. No. 687,872
Term of patent 14 years
U.S. Cl. D26—46

288,725
DECORATIVE TABLE LAMP
Nikolaus P. Fisher, 8296-1 Karam Blvd., Warren, Mich. 48093
Filed Sep. 24, 1984, Ser. No. 653,100
Term of patent 14 years
U.S. Cl. D26—94



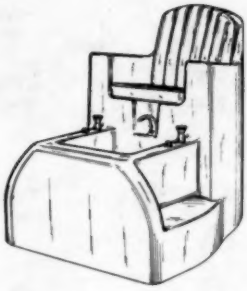
288,726
HAIR DRYER
Ronald L. Muller, Old Saybrook, Conn., assignor to North American Philips Corporation, New York, N.Y.
Filed Mar. 7, 1985, Ser. No. 709,161
Term of patent 14 years
U.S. Cl. D28—13



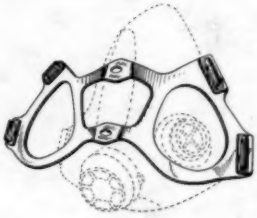
288,727
NECK SUPPORT FOR SHAMPOO BASIN
John D. Mandeville, 5823 W. 38th Ave., Unit Rear, Denver, Colo. 80212
Filed Apr. 4, 1986, Ser. No. 850,343
Term of patent 14 years
U.S. Cl. D28—20

288,728
RAZOR HANDLE
Roger Zogolovitch, London, England, assignor to Charterhouse Estates Limited, Great Britain
Filed Sep. 28, 1984, Ser. No. 656,089
Claims priority, application United Kingdom, Mar. 29, 1984, 1018 798
Term of patent 14 years
U.S. Cl. D28—48

288,729
WHIRLPOOL PEDICURE STATION
John Meyerovich, 4852 N. 105th St., Milwaukee, Wis. 53225; Lev Yakubovich, 4121 W. Martin Dr., Apt. #102, Milwaukee, Wis. 53208, and Gerald Tearney, New Berlin, Wis. 53151
Filed Aug. 30, 1985, Ser. No. 771,035
Term of patent 14 years
U.S. Cl. D28—61

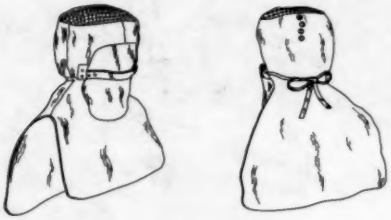


288,730
YOKE FOR A RESPIRATOR
Edward N. Montesi, Barrington, R.I., assignor to Siebe North, Inc., Charleston, S.C.
Filed May 21, 1984, Ser. No. 612,577
Term of patent 14 years
U.S. Cl. D29—7

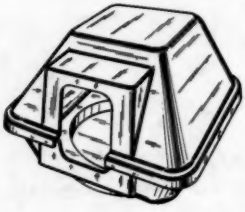


288,731
CANISTER-HOLDING HOUSING OF EMERGENCY MASK
Katsumi Fujinuma, 2-105, 1100-4, Ohaza-Iwatsuki, Iwatsuki City, Saitama Pref., Japan
Filed Oct. 3, 1984, Ser. No. 657,163
Claims priority, application Japan, Apr. 7, 1984, 59-13499
Term of patent 14 years
U.S. Cl. D29—7

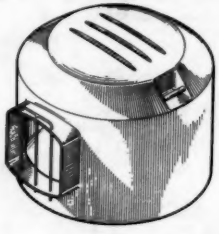
288,732
CLEAN ROOM HOOD
Teresa L. Widener; Richard L. Prilliman; James B. Wilhelm, Jr.; Donna A. Barger, all of Austin, and Valerie J. Trombley, Cedar Creek, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 24, 1983, Ser. No. 544,941
Term of patent 14 years
U.S. Cl. D29—15



288,733
PET SHELTER
Scott D. Welker, 1147 Key St., Maumee, Ohio 43537
Filed Oct. 12, 1984, Ser. No. 660,311
Term of patent 14 years
U.S. Cl. D30—1

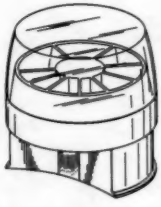


288,734
ANIMAL TRANSPORTER
Donald R. Wallace, 32453 Jaclynn Dr., Union City, Calif. 94586, and Donald E. Looby, 28147 Dobbel Ave., Hayward, Calif. 94542
Filed Mar. 12, 1984, Ser. No. 588,644
Term of patent 14 years
U.S. Cl. D30—1



288,735
AQUARIUM
Robert D. Jones, 2102 W. Brooks, #D, Norman, Okla. 73069, and James O. Easley, 1908 Willow Way Cir., Edmond, Okla. 73034
Filed Apr. 8, 1985, Ser. No. 721,064
Term of patent 14 years
U.S. Cl. D30—9

288,736
PET FOOD DISPENSER
Manuel Cornrich, 7 Fruitland Dr., New Castle, Pa. 16105
Filed Feb. 27, 1985, Ser. No. 706,161
Term of patent 14 years
U.S. Cl. D30—13

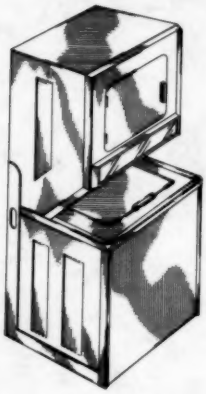


288,737

COMBINED WASHER AND DRYER

Robert L. Deatherage; Stephen D. Schober, and William J. Swartz, all of Newton, Iowa, assignors to The Maytag Company, Newton, Iowa

Filed Apr. 16, 1984, Ser. No. 600,394
Term of patent 14 years
U.S. Cl. D32—5

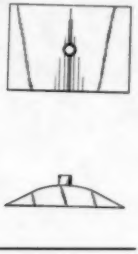


288,738

SOOT SHIELD FOR ATTACHMENT TO A VACUUM

Sherman D. Rennels, 3636 NW. 20th, Oklahoma City, Okla. 73107

Filed Oct. 15, 1984, Ser. No. 660,726
Term of patent 14 years
U.S. Cl. D32—31



288,739

PORTABLE CART FOR AUTOMOBILE HARDTOP

Leon W. Johnson, Jr., 9130 Hwy. 5, Douglasville, Ga. 30134, and Tomie L. Turner, 3220 Anderson Dr., Lithia Springs, Ga. 30057

Filed May 27, 1986, Ser. No. 867,742
Term of patent 14 years
U.S. Cl. D34—17

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF MARCH, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A/S Norsk Elektrisk & Brown Boveri: *See*—
Nilsen, Gunnar; Wang, Erik; and Moen, Ingar, 4,649,237, Cl. 200-15.000.

Aarts, Thomas M. G.: *See*—
Castelijns, Anna M. C. F.; and Aarts, Thomas M. G., 4,649,211, Cl. 558-430.000.

AB Electrolux: *See*—
Andreasson, Bo C.; and Faijersseon, Sven I., 4,648,375, Cl. 123-602.000.

AB Pripps Bryggerier: *See*—
Gyllang, Hans E.; Ekblom, Bjorn T.; Wesshagen, Vera V.; and Ericson, Kjell Y., 4,649,051, Cl. 424-154.000.

AB Varnamo Gummifabrik: *See*—
Haggqvist, Alf, 4,648,221, Cl. 52-202.000.

Abdelmaseh, Michael E.; and Shorey, Thomas H., to Boeing Company, The. Method and apparatus for supporting interior aircraft elements. 4,648,570, Cl. 244-118.100.

Abe, Kazuo; and Shimamura, Akira, to Nisshin-Dca Foods Inc. Crude material forming machine. 4,648,828, Cl. 425-288.000.

Abe, Koichi, to Northern Telecom Limited. Optical fiber. 4,648,891, Cl. 65-3.120.

Abe, Miki; and Suzuki, Tadso, to Sony Corporation. Analogue to digital converter. 4,649,372, Cl. 340-347.0NT.

Abeco Limited: *See*—
Bieganski, Zdzislaw, 4,648,773, Cl. 414-411.000.

Abinett, Raymond E., to Water Research Centre. Pipe laying and replacement. 4,648,746, Cl. 405-184.000.

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Melzi, Carlo; and Gregorutti, Paolo, 4,648,434, Cl. 152-213.00A.

Achar, Bappalige N.; Fohlen, George M.; and Parker, John A., to United States of America, National Aeronautics and Space Administration. Process for preparing phthalocyanine polymer from imide containing bisphthalonitrile. 4,649,189, Cl. 528-220.000.

Ackermann, Henry A., to Honeywell Inc. Compartmented storage container. 4,648,524, Cl. 220-22.000.

Ackrad Laboratories, Inc.: *See*—
Landis, Robert; and Kassay, Joseph E., 4,648,393, Cl. 128-200.230.

Acme Plastics, Inc.: *See*—
McQueen, Phillip J., 4,648,554, Cl. 238-283.000.

AcroMed Corporation: *See*—
Steffee, Arthur D., 4,648,388, Cl. 128-69.000.

Adams, Kenneth J.; and Dyke, David E., to Clevite Industries Inc. Method of bonding a high temperature resistant polymeric material to an aluminum base substrate and article therefrom. 4,648,910, Cl. 148-6.200.

Addor, Roger W.; Wright, Donald P., Jr.; Siddens, Jack K.; and Hand, John J., to American Cyanamid Company. Insecticidal uses of diaminoguanidine hydrazone compounds. 4,649,148, Cl. 514-321.000.

Adler, Percy. Bicycle support device. 4,648,597, Cl. 272-73.000.

Adnovum AG: *See*—
Lauchenauer, Alfred E., 4,649,077, Cl. 428-317.100.

Advani, Hira; Loucks, Larry K.; and Springen, Nancy L., to International Business Machines Corp. Device driver and adapter binding technique. 4,649,479, Cl. 364-300.000.

Aegis, Inc.: *See*—
Scherer, Jeremy D.; and Tower, Steven A., 4,649,229, Cl. 174-52.0FP.

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Brull, John J.; and Schmitz, Robert E., 4,648,214, Cl. 51-410.000.

Agano, Toshitaka: *See*—
Fukai, Nobutaka; Ohara, Yuji; and Agano, Toshitaka, 4,648,685, Cl. 350-6.600.

Agdanowski, Ronald T.; Geil, James A.; and Tatro, Bernard J., to Sherwood Medical Company. Nasal cannula. 4,648,398, Cl. 128-207.180.

Agency of Industrial Science & Technology: *See*—
Ishikawa, Toshikatsu; Teranishi, Haruo; Imai, Yoshikazu; and Nagata, Yoichi, 4,649,060, Cl. 427-57.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Rauskolb, Wilfried; Treiber, Helmut; and Nitsch, Wilhelm, 4,649,422, Cl. 358-76.000.

Ahmed, Haroon: *See*—
Cleaver, John R. A.; and Ahmed, Haroon, 4,649,316, Cl. 313-361.100.

Ahtola, Unto; and Kuusento, Jaakko, to Oy Tampella Ab. Pressure fluid operated percussion drilling machine provided with a rotation mechanism. 4,648,467, Cl. 173-107.000.

Aichert, Hans; Bauer, Volker; Feuerstein, Albert; and Ranke, Horst, to Leybold-Heraeus GmbH. Vacuum depositing apparatus. 4,648,347, Cl. 118-720.000.

Aig, Edward R.; Coffey, John W.; Lovey, Allen J.; and Rosenberger, Michael, to Hoffmann-La Roche Inc. Phenyl substituted-2,4,6,8-nonatetraenoic acid. 4,648,996, Cl. 260-410.90R.

Aigner, Karl. Device for in vivo purification of blood. 4,648,865, Cl. 604-4.000.

Aires, Ramon H.; Clark, Charles A., Jr.; Ito, Roy A.; and Hackett, Kenneth R., to Teloc R & D Ltd. Electronic locating system for persons receiving telephone calls. 4,649,385, Cl. 379-57.000.

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Kayakabe, Nobuhiro; Sugiura, Tadashi; and Sugimoto, Hitoshi, 4,648,163, Cl. 29-159.00R.
Oumi, Takeharu; Kageyama, Toshinobu; and Mushika, Sadahiko, 4,648,385, Cl. 128-1.00D.

Akab of Sweden AB: *See*—
Ragnebring, Chris, 4,648,336, Cl. 112-147.000.

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Westerlund, Borje; and Vestring, Arne, 4,648,319, Cl. 102-202.120.

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Johnstone, Thomas O.; and Dawe, Thomas W., 4,649,008, Cl. 264-177.100.

Aldenhoven, Ghislanus M. A. M., to U.S. Philips Corporation. Disc-record player comprising a pressure member for pressing a record disc against the turntable. 4,649,532, Cl. 369-270.000.

Alender, Wolfgang J.; Anders, Heinz-Gerhard; and Leuthner, Hermann J., to Cooper Industries. Power screwdriver. 4,648,282, Cl. 73-862.230.

Ales, Thomas M., to Kimberly-Clark Corporation. Method and apparatus for applying discrete strips of material to a longitudinally extending web. 4,648,928, Cl. 156-164.000.

Alex, Wayne E.; and Cook, Harold T., Jr., to Marco Seattle, Inc. Circle hook baiter. 4,648,193, Cl. 43-4.000.

Alexander, Jack L., to Combustion Engineering, Inc. Gas compressor. 4,648,806, Cl. 417-238.000.

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Fennel, Helmut; and Wupper, Hans, 4,648,662, Cl. 303-92.000.
Kunze, Lothar; Greeb, Rolf; and Bender, Ralf, 4,648,420, Cl. 137-312.000.
Schmoelzer, Ernst, 4,648,489, Cl. 188-195.000.

Allan, Geoffrey; Miller, Alistair A.; and Sawyer, David A., to Burroughs Wellcome Co. 1,2,4-triazines. 4,649,139, Cl. 514-242.000.

Allen-Bradley Company, Inc.: *See*—
Alexander, Robert H.; Lawson, John R.; and Falter, Ronald C., 4,648,756, Cl. 408-9.000.

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Allen, J. Dewayne. Vibratory screed including a spreading device for leveling and distributing plastic concrete in front of the screed. 4,648,741, Cl. 404-119.000.

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Deysarkar, Asoke K.; and Allen, James D., 4,648,263, Cl. 73-59.000.

Allied Corporation: *See*—
Lang, Roger J., 4,648,677, Cl. 339-99.00R.
Marsh, Gary B.; Fanelli, Anthony J.; Armor, John N.; and Zambri, Patrick M., 4,649,037, Cl. 423-338.000.
Pelczarski, Walter J., 4,648,679, Cl. 339-99.00R.
Peterson, Weldon H.; and Morrison, Kenneth G., 4,648,830, Cl. 425-464.000.
Punako, Stephen; and MacAvoy, David W., 4,648,670, Cl. 339-89.00R.
Sanchez, Joseph J., Jr., 4,648,674, Cl. 339-97.00P.
Torban, Yefim; and Hary, Joseph, 4,648,671, Cl. 339-89.00R.
Yamaguchi, Hiroshi; Tanaka, Teruaki; Hirai, Masatake; Kohketsu, Tadashi; Matsumoto, Masahiro; and Kawate, Kenji, 4,649,248, Cl. 219-10.570.

Allis-Chalmers Corporation: *See*—
Jenness, Raymond C., 4,648,561, Cl. 241-34.000.

Alpha Metal Corp.: *See*—
Lee, Dickey, 4,648,481, Cl. 182-28.000.

Alps Electric Co., Ltd.: *See*—
Ichihara, Akira, 4,649,444, Cl. 360-99.000.
Matsuta, Shigetoshi, 4,649,461, Cl. 361-415.000.
Yamashita, Tatsumaro, 4,649,306, Cl. 310-90.000.

Alsthom: *See*—
Thuries, Edmond, 4,649,243, Cl. 200-148.00A.

Altschul, Barry: *See*—
Borkowski, Michael T.; Laighton, David G.; and Altschul, Barry, 4,649,416, Cl. 357-74.000.

Aluminum Company of America: *See*—
Hunt, Warren H., Jr.; Sawtell, Ralph R.; and Bretz, Philip E., 4,648,913, Cl. 148-12.70A.
LaBarge, Robert L.; and Heffner, Robert E., 4,648,528, Cl. 220-240.000.
Oliver, Dickon T.; and Stewart, D. Fred, 4,648,257, Cl. 72-16.000.

Alves, Dario M. Tamper-proof package and method. 4,648,509, Cl. 206-459.000.

ALZA Corporation: *See*—
Urquhart, John; and Theeuwes, Felix, 4,649,043, Cl. 424-469.000.

Amblard, Albert. Apparatus for drilling into a pipe under pressure. 4,648,422, Cl. 137-318.000.

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AMCA International Corporation: *See*—
Plummer, Harvey R., 4,648,757, Cl. 408-12.000.

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Graziano, Lewis R., 4,648,933, Cl. 156-361.000.

American Cyanamid Company: *See*—
Addor, Roger W.; Wright, Donald P., Jr.; Siddens, Jack K.; and Hand, John J., 4,649,148, Cl. 514-321.000.
Asato, Goro; and Ross, Lawrence J., 4,649,158, Cl. 514-554.000.
Giglia, Robert D., 4,648,902, Cl. 75-229.000.
Kantor, Sidney; and Kennett, Robert L., Jr., 4,649,143, Cl. 514-279.000.

American Home Products Corporation: *See*—
Wilson, Jan S., 4,649,049, Cl. 424-89.000.

American Hospital Supply Corporation: *See*—
Bobo, Donald E., Jr., 4,648,869, Cl. 604-49.000.
Carpentier, Alain; Carpentier, Sophie; and Nashef, Aws S., 4,648,881, Cl. 623-11.000.
Hardwick, Martha K.; Pike, Kelly A.; Evans, George D., II; Edwards, Ronald; and Norman, Jacob J., 4,648,868, Cl. 604-32.000.

American Institutional Maintenance Corporation: *See*—
Imhoff, Lee A., 4,648,253, Cl. 70-135.000.

American Screen Printing Equipment Co.: *See*—
Bubley, Henry J.; and Iaccino, Alex, 4,648,317, Cl. 101-123.000.

American Sterilizer Company: *See*—
Makinen, Ralph W.; and Rickloff, James R., 4,648,978, Cl. 210-759.000.

Amerson, Roger H.: *See*—
Dorumsgaard, John A.; and Amerson, Roger H., 4,648,774, Cl. 414-416.000.

Ametek, Inc.: *See*—
Wham, John L.; Mackey, Lawrence A.; and Haselton, Frederick R., 4,648,345, Cl. 114-338.000.

Amoco Corporation: *See*—
Gash, Bruce W.; Arri, Luis E.; Hunt, Elton B., Jr.; and Parrish, David R., 4,648,450, Cl. 166-259.000.
Mount, Houston B., II, 4,649,550, Cl. 375-37.000.

Amort, Jurgen: *See*—
Suerken, Hans P.; Amort, Jurgen; Hanisch, Horst; and van der Maas, Hendrikus, 4,649,220, Cl. 564-296.000.

AMP Incorporated: *See*—
Ashman, John J.; and Caron, Bernard G., 4,648,688, Cl. 350-96.200.
Atherton, Charles G.; and Swartz, John C., 4,649,304, Cl. 310-71.000.
Davis, Wayne S.; Defibaugh, George R.; and Fortuna, Jon A., 4,648,665, Cl. 339-14.00R.
Kobler, Robert J., 4,648,672, Cl. 339-94.00M.
Lovell, Gregory R., 4,648,666, Cl. 339-17.0CF.
Marks, Richard L.; and Parker, William T., 4,648,669, Cl. 339-75.00M.
Pass, Raymond V.; Schroeder, James L., III; and Ney, Reuben E., 4,648,681, Cl. 339-147.00R.
Sinisi, David B., 4,648,668, Cl. 339-74.00R.

Ampex Corporation: *See*—
Linke, George A., 4,649,450, Cl. 360-129.000.
Louth, Kenneth, 4,649,441, Cl. 360-71.000.

Anchor Industries, Inc.: *See*—
Daus, John J., Jr.; and James, Henry E., 4,648,734, Cl. 403-170.000.

Anders, Heinz-Gerhard: *See*—
Alender, Wolfgang J.; Anders, Heinz-Gerhard; and Leuthner, Hermann J., 4,648,282, Cl. 73-862.230.

Anderson, Gregory A.; Eason, Paul M.; and Wheelwright, Lynn M., to Hewlett-Packard Company. Spectrum analyzer with improved data analysis and display features. 4,649,496, Cl. 364-485.000.

Anderson, John A., to VirTis Company, Inc., The. Cell culturing apparatus with improved stirring and filter means. 4,649,118, Cl. 435-316.000.

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Harms, John R.; and Anderson, Ronald L., 4,648,780, Cl. 414-686.000.

Andersson, Conny; and Kollberg, Sten, to Asea AB. Apparatus for the continuous casting of metal. 4,648,440, Cl. 164-504.000.

Ando, Akira: *See*—
Ogawa, Toshio; Fujishima, Satoru; and Ando, Akira, 4,649,313, Cl. 310-358.000.

Ando, Kenji: *See*—
Nakamura, Takeshi; Matsumoto, Ikuo; and Ando, Kenji, 4,649,310, Cl. 310-321.000.

Ando, Takao: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,649,133, Cl. 514-42.000.

Andrade, Joseph D.: *See*—
Benner, Robert E.; Andrade, Joseph D.; Van Wagenen, Richard A.; and Westenskow, Dwayne R., 4,648,714, Cl. 356-301.000.

Andreasson, Bo C.; and Faijerseon, Sven I., to AB Electrolux. Capacitor ignition system. 4,648,375, Cl. 123-602.000.

Andrejeski, Gary J.: *See*—
Fruechte, Kevin M.; Andrejeski, Gary J.; and Brastz, Robert E., 4,648,427, Cl. 137-826.000.

Andrews, LaVern A.; and Moraitis, Dennis, to Hughes Aircraft Company. Two dimension radar system with selectable three dimension target data extraction. 4,649,390, Cl. 342-140.000.

Andrews Maclaren Limited: *See*—
Hawkes, Peter C., 4,648,651, Cl. 297-45.000.

Angelchik, Jean P. Peroral apparatus for morbid obesity treatment. 4,648,383, Cl. 128-1.00R.

Angona, Frank A.; and Zemanek, Joseph, Jr., to Mobil Oil Corporation. Shear wave acoustic logging system. 4,649,525, Cl. 367-31.000.

Angseryd, Jan: *See*—
Timerdahl, Ake; and Angseryd, Jan, 4,648,839, Cl. 433-77.000.

Anma, Masao: *See*—
Kato, Heizaburou; and Anma, Masao, 4,648,288, Cl. 74-798.000.

ANT Nachrichtentechnik GmbH: *See*—
Ullman, Wolfgang, 4,649,355, Cl. 333-106.000.

Aoki, Katashi. Injection stretching blow molding machine. 4,648,824, Cl. 425-150.000.

Aoki, Masanobu: *See*—
Asano, Kazuhiko; Takezoe, Osamu; Yasuda, Yoshinori; Hayashi, Kenji; Aoki, Masanobu; Doi, Yoshio; and Shimata, Makoto, 4,648,918, Cl. 148-439.000.

Apostolos, John T., to Sanders Associates, Inc. Two dimensional transform utilizing ultrasonic dispersive delay line. 4,649,392, Cl. 342-192.000.

Arai, Koichi: *See*—
Shibasaki, Sohei; Iwasaki, Yasumasa; Ono, Noriki; Arai, Koichi; Maruyama, Koji; and Shimanari, Tatsumi, 4,648,706, Cl. 355-43.000.

Arai, Mikiya: *See*—
Wtanabe, Kenshu; Shiba, Kiminori; Arai, Mikiya; Yamaguchi, Masaya; Fujiki, Yasuo; and Fujimoto, Ryohei, 4,648,480, Cl. 181-158.000.

Arai, Shigeharu; and Otsuka, Minoru, to Ogura Clutch. Control circuits for electromagnetic coupling apparatus. 4,649,458, Cl. 361-152.000.

Arai, Takao: *See*—
Nishimura, Keizo; Kobayashi, Masaharu; Okamoto, Hiroo; Noguchi, Takaharu; Arai, Takao; and Shibuya, Toshifumi, 4,649,542, Cl. 371-39.000.

Arai, Yukou: *See*—
Ishii, Shinzo; Katsumata, Shigeo; Arai, Yukou; Fujimoto, Kazuhisa; and Morimoto, Makoto, 4,649,199, Cl. 544-342.000.

Araki, Hitoshi: *See*—
Yokoya, Yuji; Buma, Shuuichi; Araki, Hitoshi; Miyata, Hiroshi; Hirose, Masanori; and Ohashi, Kaoru, 4,648,621, Cl. 280-707.000.

Araki, Satoru, to Shingawa Daikasuto Kogyo Kabushiki Kaisha. Charge forming apparatus. 4,648,998, Cl. 261-34.200.

Archer, Lee A., to Brand-Rex Company. Electrical connector. 4,648,678, Cl. 339-99.00R.

Ariizumi, Shoji: *See*—
Iwase, Taira; Ariizumi, Shoji; and Masuoka, Fujio, 4,649,412, Cl. 357-41.000.

Arkin, Karlie J.: *See*—
Sutton, Jimmy; Shearer, Wanda; Arkin, Karlie J.; Spoelstra, Jeffrey A.; Weiss, Steven M.; Ramsey, Sherry L.; Hurlbut, Kyle; Culbertson, W. Bruce; and Burns, Robert R., 4,649,499, Cl. 364-518.000.

Armor, John N.: *See*—
Marsh, Gary B.; Fanelli, Anthony J.; Armor, John N.; and Zambri, Patrick M., 4,649,037, Cl. 423-338.000.

Armstrong, Robert B.; Jongenburger, Huibert S.; and Sadhukhan, Pasupati, to M. W. Kellogg Company. Apparatus for contacting fluid with solid. 4,648,999, Cl. 261-77.000.

Arnold, Ben: *See*—
Arnold, Ben A., 4,649,561, Cl. 378-207.000.

Arnold, Ben A., to Arnold, Ben. Test phantom and method of use of same. 4,649,561, Cl. 378-207.000.

Arragon, Jean-Pierre; Cantou, Christian; and Marie, Gerard J. M., to La Radiotechnique. Pseudo-random binary sequency generator. 4,649,419, Cl. 380-20.000.

Arri, Luis E.: *See*—
Gash, Bruce W.; Arri, Luis E.; Hunt, Elton B., Jr.; and Parrish, David R., 4,648,450, Cl. 166-259.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Terashi, Hiroto, 4,649,431, Cl. 358-228.000.

Asahi, Yoshio: *See*—
Maki, Takao; Murayama, Kenji; and Asahi, Yoshio, 4,649,217, Cl. 562-528.000.

Asano, Kazuhiko; Takezoe, Osamu; Yasuda, Yoshinori; Hayashi, Kenji; Aoki, Masanobu; Doi, Yoshio; and Shimata, Makoto, to Kabushiki Kaisha Kobe Seiko Sho. Abrasion resistant aluminum alloy. 4,648,918, Cl. 148-439.000.

Asato, Goro; and Ross, Lawrence J., to American Cyanamid Company. Novel salts of 1-(aminodihalophenyl)-2-aminoethanols and antilipogenic compositions prepared therefrom. 4,649,158, Cl. 514-554.000.
Asea AB: *See*—
Andersson, Conny; and Kollberg, Sten, 4,648,440, Cl. 164-504.000.
ASEA Aktiebolag: *See*—
Hok, Bertil; and Jonsson, Lars, 4,649,271, Cl. 250-227.000.
Ashby, Carol I. H.; and Dishman, James L., to United States of America, Energy. Dopant type and/or concentration selective dry photochemical etching of semiconductor materials. 4,648,936, Cl. 156-643.000.
Ashby, Carol I. H.; and Dishman, James L., to United States of America, Energy. Composition/bandgap selective dry photochemical etching of semiconductor materials. 4,648,938, Cl. 156-643.000.
Ashihara, Yoshihiro: *See*—
Kasahara, Yasushi; Ashihara, Yoshihiro; and Suzuki, Hiromasa, 4,649,105, Cl. 435-5.000.
Ashland Oil, Inc.: *See*—
Reid, William F., 4,649,170, Cl. 524-247.000.
Ashman, John J.; and Caron, Bernard G., to AMP Incorporated. Connector for fiber optic member including polishing fixture and method of terminating same. 4,648,688, Cl. 350-96.200.
Assimon, Andre : *See*—
Daty, Jean; and Assimon, Andre , 4,649,116, Cl. 435-287.000.
Astra-Tech Aktiebolag: *See*—
Lundback, Stig, 4,648,877, Cl. 623-3.000.
AT&T Bell Laboratories: *See*—
Holder, Clinton H., Jr.; Kirsch, Howard C.; and Stefany, James H., 4,649,523, Cl. 365-203.000.
Kirsch, Howard C., 4,649,522, Cl. 365-189.000.
Shoji, Masakazu, 4,649,296, Cl. 307-451.000.
Tuhy, Frank P., Jr., 4,649,298, Cl. 307-473.000.
AT&T Information Systems Inc.: *See*—
Cubbison, Richard J., Jr., 4,649,468, Cl. 363-62.000.
AT&T Technologies, Inc.: *See*—
Mahler, James A.; and Munie, Gregory C., 4,648,547, Cl. 228-180.100.
Atherton, Charles G.; and Swartz, John C., to AMP Incorporated. Interconnection system for electrical motors. 4,649,304, Cl. 310-71.000.
Atlantic Richfield Company: *See*—
Biggs, Michael D.; and Schuh, Frank J., 4,648,469, Cl. 175-7.000.
Atlas, David. Radar detection of hazardous small scale weather disturbances. 4,649,388, Cl. 342-26.000.
Atun, Albert: *See*—
De Luca, Paul V.; Atun, Albert; and Shatzkin, Michael, 4,649,236, Cl. 379-327.000.
Atwood Vacuum Machine Company: *See*—
Cox, David C.; and Marx, Thomas O., 4,648,657, Cl. 297-341.000.
Augat Inc.: *See*—
Holt, Richard C., 4,648,180, Cl. 29-847.000.
Auregan, Marcel: *See*—
Clarisse, Christian; Riou nee Meston, Marie-Therese; and Auregan, Marcel, 4,649,195, Cl. 540-143.000.
Avantek, Inc.: *See*—
Khanna, Amarpal S., 4,649,354, Cl. 331-99.000.
Avdel Limited: *See*—
Frearson, William H., 4,648,258, Cl. 72-391.000.
Avicola, Kenneth, to Exxon Production Research Co. Multi-channel fiber optic sensor system. 4,649,529, Cl. 367-149.000.
Avram, Elena: *See*—
Revici, Emanuel, 4,649,152, Cl. 514-425.000.
Axhamre International AB: *See*—
Granlund, Ingvar, 4,648,574, Cl. 248-349.000.
Aylies, Sargeant E.: *See*—
Brown, Robert L.; and Aylies, Sargeant E., 4,648,935, Cl. 156-577.000.
Azuchi, Yukihiro, to Murata Manufacturing Co., Ltd. Rotary electric devices. 4,649,459, Cl. 361-293.000.
Azuma, Masaaki: *See*—
Uchino, Hayashi; Azuma, Masaaki; Ohashi, Takehisa; and Watanabe, Kiyoshi, 4,649,197, Cl. 544-258.000.
B-Bar-B, Inc.: *See*—
Holland, Willard D., 4,648,233, Cl. 53-55.000.
B. H. Tytewadd Marketing, Incorporated: *See*—
Talbot, Laurel C.; and Reed, Wilbur T., 4,649,457, Cl. 361-127.000.
Baba, Masayoshi: *See*—
Fujii, Takayuki; and Baba, Masayoshi, 4,648,650, Cl. 296-203.000.
Babcock & Wilcox Company, The: *See*—
Birchak, Robert J.; Harris, Flora J.; and Holt, Amos E., 4,649,343, Cl. 324-220.000.
Gohara, Wadie F., 4,648,353, Cl. 122-4.00D.
Kidwell, John H.; Prueter, William P.; and Eaton, Andrew M., 4,648,890, Cl. 55-347.000.
Baginski, Pierre; and Nebon, Jean-Pierre, to Merlin Gerin. Control device of an electric circuit breaker. 4,649,244, Cl. 200-153.0SC.
Bailey, R. Roby, Jr.: *See*—
Lessig, William R., III; Wheeler, Dale K.; Bailey, R. Roby, Jr.; and Smith, Stephen W., 4,649,245, Cl. 200-157.000.
Bailey, Terry R., to Minnesota Mining and Manufacturing Company. High-angularity retroreflective sheeting and method for manufacture. 4,648,932, Cl. 156-276.000.
Baker, Christopher J.; and Kernohan, Craig D. Furrow opener operating apparatus. 4,648,466, Cl. 172-260.500.
Baker, Lawrence J.: *See*—
Winbow, Graham A.; and Baker, Lawrence J., 4,649,526, Cl. 367-35.000.
Baker Oil Tools, Inc.: *See*—
Luke, Mike A., 4,648,455, Cl. 166-303.000.
Ross, Richard J.; and Klumpyan, Joseph N., 4,648,457, Cl. 166-332.000.
Bakuradze, Georgy V.: *See*—
Gaprindashvili, Khanzerifa I.; Kogan, Vadim E.; Kekelia, Dzhemal I.; Pronkin, Alexei A.; Salukvadze, Nana A.; Bakuradze, Georgy V.; and Evstropiev, Konstantin K., deceased, 4,649,126, Cl. 501-43.000.
Baldamus, Haimo; Szerdahelyi, Ferenc; Hess, Peter; and Bauer, Manfred, to Brose Fahrzeugteile GmbH & Co. Kommanditgesellschaft. Door unit for motor vehicles. 4,648,208, Cl. 49-502.000.
Baliozian, Mardick. Lighting appliance having high diffusion power. 4,649,463, Cl. 362-17.000.
Ballard, Gary W.: *See*—
Thompson, Kevin D.; Ballard, Gary W.; and Mamot, Robert M., 4,648,551, Cl. 236-49.000.
Bally Manufacturing Corporation: *See*—
Olliges, William E., 4,648,600, Cl. 273-138.00A.
Ban, Itsuki; Kii, Toshiyuki; and Mitsuta, Yuji. Blind guide device. 4,648,710, Cl. 356-4.000.
Bando Kagaku Kabushiki Kaisha: *See*—
Matsunaga, Yasuyuki, 4,648,856, Cl. 474-237.000.
Baran, Walter J., Jr.; Chaplin, Gary F.; and Laurello, Vincent P., to United Technologies Corporation. Stator vane support assembly. 4,648,792, Cl. 415-139.000.
Barbanton, Jacques: *See*—
Ferrand, Gerard; Barbanton, Jacques; and Depin, Jean-Claude, 4,649,153, Cl. 514-443.000.
Barber, James C., to James C. Barber and Associates, Inc. Production of phosphorus and phosphoric acid. 4,649,035, Cl. 423-317.000.
Barkatt, Aaron; and Macedo, Pedro B., to Macedo, Pedro B.; and Litovitz, Theodore A. Process of using improved silica-based chromatographic supports containing additives. 4,648,975, Cl. 210-656.000.
Barmag Barmer Maschinenfabrik AG: *See*—
Schippers, Heinz; and Hertell, Siegfried, 4,648,810, Cl. 417-383.000.
Barnabe, Jean-Pierre: *See*—
Mouhot, Frederic; Barnabe, Jean-Pierre; Hoblingre, Andre ; and Clerc, Michel, 4,648,624, Cl. 280-775.000.
Barnett, Peter W. Acoustic systems. 4,649,564, Cl. 381-63.000.
Barry, Michael J.; Senior, Adrian; and Beech, Alan E., to Dresser U.K. Limited. Pre-start warning system and machine incorporating such system. 4,649,288, Cl. 307-84.000.
Bartley, William J., to Union Carbide Corporation. Hydrogenolysis of polyalkylene glycols to produce monoethylene glycol monoalkyl ethers, monoethylene glycol and ethanol. 4,649,225, Cl. 568-678.000.
Bas-Tex Corporation: *See*—
Hagner, Robert C., 4,648,632, Cl. 285-334.100.
BASF Aktiengesellschaft: *See*—
Colberg, Horst; and Mayer, Udo, 4,648,993, Cl. 540-134.000.
Fischer, Juergen; Zeiner, Hartmut; Nissen, Dietmar; Heinz, Gerhard; and Neumann, Peter, 4,649,080, Cl. 428-419.000.
Leyrer, Reinhold J.; Wegner, Gerhard; and Mueller, Michael, 4,649,100, Cl. 430-326.000.
Roche, Peter; and Rank, Mathaeus, 4,649,162, Cl. 521-78.000.
BASF Corporation: *See*—
Hays, Byron G.; and Stansback, Robert J., 4,648,907, Cl. 106-30.000.
Panek, Edward J.; and Davis, Paula, 4,649,224, Cl. 568-624.000.
Bass, Walter E.; Matyas, Stephen M.; and Oseas, Jonathan, to International Business Machines Corporation. Method for establishing user authenication with composite session keys among cryptographically communicating nodes. 4,649,233, Cl. 380-21.000.
Battig, Johann R., to Dow Chemical Company, The. Dispenser carton with dual interdigitating cutting edges. 4,648,537, Cl. 225-43.000.
Bauer, Manfred: *See*—
Baldamus, Haimo; Szerdahelyi, Ferenc; Hess, Peter; and Bauer, Manfred, 4,648,208, Cl. 49-502.000.
Bauer, Siegfried: *See*—
Stockburger, Hermann; and Bauer, Siegfried, 4,649,265, Cl. 235-380.000.
Bauer, Volker: *See*—
Aichert, Hans; Bauer, Volker; Feuerstein, Albert; and Ranke, Horst, 4,648,347, Cl. 118-720.000.
Bauer, Willi: *See*—
Dassler, Armin A.; and Bauer, Willi, 4,648,187, Cl. 36-134.000.
Baugh, Hollis A., to Vetco Offshore, Inc. Underwater connector. 4,648,629, Cl. 285-26.000.
Baumann, John A.: *See*—
Brock, David G.; and Baumann, John A., 4,649,024, Cl. 427-82.000.
Baumgart, Herbert P. Security device for electrical plug. 4,648,667, Cl. 339-37.000.
Baviere, Marc; Moulu, Jean-Claude; Paal, Tibor; Tiszai, Gyorgy; Gaal, Gyorgyi; Schmidt, Laszlo; and Gesztesi, Gyula, to Institut Francais du Petrole; and Magyar Szenhidrogenipari Kutato-Fejleszto Intezet. Enhanced oil recovery process by injecting a micellar solution of surfactants having a solubility gradient in water. 4,648,451, Cl. 166-273.000.
Baxter Travenol Laboratories, Inc.: *See*—
Di Gianfilippo, Aleandro; Figler, Alan A.; Huang, Leon; and Warner, Donald, 4,648,430, Cl. 141-1.000.

Bayer Aktiengesellschaft: *See*—
Kress, Hans-Jurgen; Bottenbruch, Ludwig; Witman, Mark; Kircher, Klaus; Lindner, Christian; and Ott, Karl-Heinz, 4,649,168, Cl. 524-130.000.

Bazell, Seymour: *See*—
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BBC Brown, Boveri & Company, Limited: *See*—
Horler, Hansulrich, 4,648,790, Cl. 415-112.000.
Kreitmeier, Franz, 4,648,791, Cl. 415-116.000.

Beal, James L. Camper-truck assembly and mounting hardware. 4,648,649, Cl. 296-156.000.

Beale, Robert B., to United States of America, Air Force. Electronically compensated pressure dilution demand regulator. 4,648,397, Cl. 128-205.110.

Bean, Edward. Bicycle wheel safety attachment. 4,648,694, Cl. 350-99.000.

Beaumont, Paul, to Grau Girling Limited. Air compressor with preloaded clutch. 4,648,805, Cl. 417-223.000.

Bech, Jean A. Induction-type planetary reducing coupling for very high speed rotating machines. 4,649,307, Cl. 310-99.000.

Beck, Andreas: *See*—
von Sprecher, Andreas; Ernest, Ivan; Main, Alan J.; and Beck, Andreas, 4,649,215, Cl. 560-152.000.

Beck, Willi K.; and Strange, Andrew, to Joseph Pollak Corporation. Clutch actuator switch. 4,649,238, Cl. 200-16.00C.

Becker, Patricia E.; and Molee, Kenneth J., to Personal Products Company. Breathable panty liner. 4,648,876, Cl. 604-370.000.

Beckerer, Frank S., Jr.; and Spangler, William F., to Beckerer, Frank S., Jr. Boat window. 4,648,435, Cl. 160-92.000.

Bedell, John R.; and Rosenthal, Eli, to Electric Power Research Institute. Amorphous metal ribbon fabrication. 4,649,254, Cl. 219-121.0LD.

Beech, Alan E.: *See*—
Barry, Michael J.; Senior, Adrian; and Beech, Alan E., 4,649,288, Cl. 307-84.000.

Behringwerke Aktiengesellschaft: *See*—
Steuer, Dagmar; and Schmidtberger, Rudolf, 4,649,120, Cl. 436-13.000.

Bekedam, Martin. Heat exchanger array for a step down return of condensate. 4,648,355, Cl. 122-412.000.

Belco Pollution Control Corporation: *See*—
Chen, James Y., 4,648,976, Cl. 210-678.000.

Bell, Stuart D. Trolling motor battery connector system. 4,649,332, Cl. 320-7.000.

Bella, Anton: *See*—
Osmera, Miroslav S.; Bella, Anton; Kallin, Fredrik L. N.; and Evans, Edward R., 4,648,591, Cl. 271-305.000.

Belle-Oudry, Michael: *See*—
De Luca, Paul V.; Shaikan, Paul; and Belle-Oudry, Michael, 4,649,456, Cl. 361-119.000.

Bellini, Enrica. Automatic bag-loading attachment for rotary bag-filling machines. 4,648,234, Cl. 53-67.000.

Belmondo, Domenico, to Dobell S.a.s. di Domenico Belmondo & C. Holder for a number of writing implements. 4,648,505, Cl. 206-214.000.

Beltronics Inc.: *See*—
Bishop, Robert, 4,649,424, Cl. 357-84.000.

Ben Clements & Sons, Inc.: *See*—
Won, Yong K., 4,648,531, Cl. 221-232.000.

Bender, Ralf: *See*—
Kunze, Lothar; Greeb, Rolf; and Bender, Ralf, 4,648,420, Cl. 137-312.000.

Benjamin, Robert F., to Benjamin, Robert F. Optical pin apparatus for measuring the arrival time and velocity of shock waves and particles. 4,649,528, Cl. 367-149.000.

Benner, Robert E.; Andrade, Joseph D.; Van Wagenen, Richard A.; and Westenskow, Dwayne R., to University of Utah. Molecular gas analysis by Raman scattering in intracavity laser configuration. 4,648,714, Cl. 356-301.000.

Bennett, William G.; and Spease, Arthur L., to Teleflex Incorporated. Method of making a remote control assembly (swivel insert). 4,649,010, Cl. 264-242.000.

Berchowitz, David M.; and Redlich, Robert W., to Sunpower, Inc. Multi-phase linear alternator driven by free-piston Stirling engine. 4,649,283, Cl. 290-1.00R.

Berger, Michael F., to Tandy Corporation. Computer revision port. 4,649,514, Cl. 364-900.000.

Berghaus, Horst: *See*—
Ley, Hans; Neumock, Udo; Scholz, Peter; Seidler, Horst; Berghaus, Horst; and Schmidt, Manfred, 4,648,295, Cl. 82-18.000.

Bergloff, Raymond A., to HR Textron Inc. Shock absorber. 4,648,490, Cl. 188-297.000.

Bergmann, Bernhard, to Von Roll AG. Socket joint. 4,648,633, Cl. 285-337.000.

Bergner, William J., to Columbia Parcar Corporation. Speed control for an electric golf car. 4,648,473, Cl. 180-65.800.

Bergwerksverband GmbH: *See*—
Stephan, Peter, 4,648,753, Cl. 405-260.000.

Berich, John J. Security chain lock for doors. 4,648,642, Cl. 292-264.000.

Bernet, Robert R. E.: *See*—
Couarc'h, Michel F. E.; Bessouat, Roger; Lafaye, Marc R. R.; and Bernet, Robert R. E., 4,648,329, Cl. 110-245.000.

Bernstein, David H.; Buckley, Edward M.; March, Roger W.; and Gusowski, Ronald I., deceased (by French, Lloyd S., administrator), to Data General Corporation. Data processing system. 4,649,470, Cl. 364-200.000.

Berth, Jorgen: *See*—
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Kuhlmann, Werner, 4,649,165, Cl. 523-116.000.

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Hough, Harold L.; and Bonazoli, Robert P., 4,649,320, Cl. 315-100.000.
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Petzold, Werner P.; and Miller, Alan L., 4,648,496, Cl. 192-0.076.
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Richard, Pierre, 4,648,223, Cl. 52-223.00R.
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Gritti, Serjio, 4,648,982, Cl. 252-75.000.
Marks, Gerald C.; and Quist, Per I., 4,648,922, Cl. 156-79.000.
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Periman, Daniel, 4,649,109, Cl. 435-30.000.
Brandimarte, Umberto L. Leveling tool. 4,648,185, Cl. 33-189.000.
Branson Ultrasonics Corporation: *See*—
Eichenauer, Karl-Friedrich, 4,648,777, Cl. 414-591.000.
Brattan, Keith: *See*—
Wardle, Ian; and Brattan, Keith, 4,648,953, Cl. 204-237.000.
Brauman, Daniel. Implantable prosthetic devices. 4,648,880, Cl. 623-8.000.
Braun, Hans J.: *See*—
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Breaux, Connie C.; and Breaux, Roddy P. Sunbathing apparatus having water spray cooling means. 4,648,143, Cl. 5-417.000.
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Vandervoort, David; and Griffith, Monty, 4,648,822, Cl. 425-135.000.
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Brion, Harvey F.: *See*—
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Bristol-Myers Company: *See*—
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Broadus, John G., to Union Oil Company of California. Process for eliminating static venting of vapor-dominated geothermal wells. 4,648,458, Cl. 166-370.000.
Brock, David G.; and Baumann, John A., to Stauffer Chemical Company. Method for forming evaporated pnictide and alkali metal polypnictide films. 4,649,024, Cl. 427-82.000.
Brophy, James F.: *See*—
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Baldamus, Haimo; Szerdahelyi, Ferenc; Hess, Peter; and Bauer, Manfred, 4,648,208, Cl. 49-502.000.
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Brown, Allan P.; and Charlebois, Leonard J., to Northern Telecom Limited. Seals. 4,648,606, Cl. 277-188.00R.
Brown, David L.; and McLaurin, Leroy D., to Westinghouse Electric Corp. Cooled combustion turbine blade with retrofit blade seal. 4,648,799, Cl. 416-95.000.

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Castner, Raymond P.; Olechovsky, David F.; Brown, Philip S.; Sinha, Susanta; Keller, Harold T.; and Cheng, Wenche W., 4,649,493, Cl. 364-472.000.
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Brown, Thomas H.; and Ife, Robert J., to Smith Kline & French Laboratories Limited. Pyrimidine compounds. 4,649,141, Cl. 514-272.000.

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Broze, Guy; and Delvenne, Jean-Paul, to Colgate-Palmolive Company. Built non aqueous liquid nonionic laundry detergent composition containing urea stabilizer and method of use. 4,648,983, Cl. 252-135.000.

Bruch, George H., to Zornes, David A. Fire hose coupling lock. 4,648,630, Cl. 285-87.000.

Brugman, Wilhelmus T. J., to Oce-Nederland B.V. Device for exposing an edge zone of a photoconductive element to light. 4,648,703, Cl. 355-3.00R.

Brugman, William H. Diskette clip. 4,649,452, Cl. 360-133.000.

Brull, John J.; and Schmitz, Robert E., to AGA Ab. Cryogen shot blast deflashing system. 4,648,214, Cl. 51-410.000.

Brunelle, Daniel J.: *See*—
Kosky, Philip G.; Silva, James M.; Brunelle, Daniel J.; and Shannon, Thomas G., 4,649,210, Cl. 558-265.000.

Brunig, Matthias A. M.; and Moller, Werner G. Apparatus for transporting and/or mixing gases. 4,648,787, Cl. 415-72.000.

Bruning, Rose M. Apparatus and method for supporting an infant in a generally semi-fowler position. 4,648,142, Cl. 5-93.00R.

Brunn, Klaus; and Polster, Walter, to Siemens Aktiengesellschaft. X-ray diagnostic system with an image intensifier television chain. 4,649,558, Cl. 378-97.000.

Brunner, Hans-Georg, to Ciba-Geigy Corporation. 2-aryl-4,6-dihalopyrimidines as antidote for protecting cultivated plants from phytotoxic damage caused by herbicides. 4,648,896, Cl. 71-90.000.

Brunswick Corporation: *See*—
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Meadows, Roger D.; Rush, James B.; and Bryan, James S., 4,648,628, Cl. 285-24.000.

Bryant, Donald L., to Rockwell International Corporation. Reducing coupling. 4,648,631, Cl. 285-177.000.

Bryn, Kristian: *See*—
Braathen, Jan; and Bryn, Kristian, 4,648,303, Cl. 84-306.000.

Bubley, Henry J.; and Iaccino, Alex, to American Screen Printing Equipment Co. Manually operated screen printing apparatus. 4,648,317, Cl. 101-123.000.

Buchanan, Max F.: *See*—
Sullivan, Robert W.; Holder, Tommie J.; and Buchanan, Max F., 4,648,358, Cl. 123-43.00A.

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Buekers, Valere: *See*—
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Yokoya, Yuji; Buma, Shuuichi; Araki, Hitoshi; Miyata, Hiroshi; Hirose, Masanori; and Ohashi, Kaoru, 4,648,621, Cl. 280-707.000.

Bunce, Kevin: *See*—
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Burgers, John; and Setzer, Ronald P. Boat hull cleaning device. 4,648,344, Cl. 114-222.000.

Burgess, Allan C.; Lussow, Robert O.; and Melvin, George E., to International Business Machines Corporation. Multiple voltage integrated circuit packaging substrate. 4,649,417, Cl. 357-80.000.

Burnett, T. J. Chicken deboning apparatus and method. 4,648,155, Cl. 17-46.000.

Burns, Robert R.: *See*—
Sutton, Jimmy; Shearer, Wanda; Arkin, Karlie J.; Spoelstra, Jeffrey A.; Weiss, Steven M.; Ramsey, Sherry L.; Hurlbut, Kyle; Culbertson, W. Bruce; and Burns, Robert R., 4,649,499, Cl. 364-518.000.

Burroughs Corporation: *See*—
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Burroughs Wellcome Co.: *See*—
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Schaeffer, Howard J., 4,649,140, Cl. 514-261.000.

Busch, Randolph A., to Halliburton Company. Tensile ring cable head assembly. 4,648,444, Cl. 166-65.100.

Busch, Roger A., to Fluor Corporation. Spar buoy fluid transfer system. 4,648,848, Cl. 441-5.000.

Bushaw, Kenneth A., to International Business Machines Corporation. Method and apparatus for producing transparent foil copies. 4,648,709, Cl. 355-77.000.

Butler, David V.: *See*—
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Butters, Brian C. F.; and Pollicott, Ian D., to Chemring PLC. Slip coating chaff. 4,649,076, Cl. 428-361.000.

Butzen, William J. Interlocking roof edge fascia system. 4,648,218, Cl. 52-96.000.

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Higuchi, Susumu, 4,648,136, Cl. 2-2.500.

C O D Inter Techniques SA: *See*—
Horvath, Laszlo S., 4,648,167, Cl. 29-428.000.

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Krouglicof, Nicholas; McKinnon, Gordon M.; and Svoboda, Jaroslav, 4,649,504, Cl. 364-559.000.

Cagan, Vladimir; and Guyot, Marcel, to Centre National de la Recherche Scientifique (CNRS). Process and device for measuring the initial permeability of ferrimagnetic materials over a wide frequency band. 4,649,495, Cl. 364-481.000.

Calco, Wayne. Collapsible chair. 4,648,658, Cl. 297-440.000.

Calltharp, Glen R.; Norcross, Kenneth L., III; and Nelson, Dennis L. Decanting apparatus. 4,648,967, Cl. 210-136.000.

Cameron, David S., to General Motors Corporation. Vehicle suspension strut with lower rotary bearing cup assembly for a dirigible road wheel. 4,648,623, Cl. 280-711.000.

Campagna, Nicholas F.: *See*—
Hwang, Tzong Y.; and Campagna, Nicholas F., 4,649,347, Cl. 324-309.000.

Campbell, Robert E.: *See*—
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Campbell, Rolf W. J., to Land O'Lakes, Inc. Package with spreader for spreadable material. 4,648,506, Cl. 206-216.000.

Camposeo, Paul V.: *See*—
Tan, Patrick; Maitland, Peter; Kawczynski, Gregory; and Camposeo, Paul V., 4,648,783, Cl. 414-730.000.

Can-Eng Holdings, Ltd.: *See*—
Thom, Terrence C., 4,648,836, Cl. 432-107.000.

Canada, Atomic Energy of, Limited: *See*—
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Capes, Charles E.; Coleman, Richard D.; Thayer, William L.; and Puddington, Ira E., 4,648,962, Cl. 208-188.000.
Dobrowolski, Jerzy A.; and Whitehead, Lorne A., 4,649,462, Cl. 362-2.000.

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Canon Kabushiki Kaisha: *See*—
Fujiyama, Yasutomo, 4,648,348, Cl. 118-723.000.
Goto, Masahiro, 4,648,702, Cl. 355-3.0DD.
Kosugi, Masao, 4,648,708, Cl. 355-53.000.
Mukohjima, Hitoshi; and Hiramatsu, Akira, 4,649,311, Cl. 310-323.000.
Sawada, Takeshi; Toda, Yasushi; and Goto, Hirokazu, 4,649,449, Cl. 360-123.000.
Takahashi, Kazuo, 4,648,725, Cl. 384-9.000.
Tamura, Yasuyuki; Kaneko, Shuzo; and Takahashi, Tohru, 4,649,094, Cl. 430-126.000.
Tomita, Yasuo, 4,649,451, Cl. 360-131.000.

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Canton, David A.; Holloway, Brian L.; Sargeant, Nicholas B.; and Llewelyn, Roger J., to International Business Machines Corp. Data display apparatus with character refresh buffer and row buffers. 4,649,379, Cl. 340-750.000.

Cantou, Christian: *See*—
Arragon, Jean-Pierre; Cantou, Christian; and Marie, Gerard J. M., 4,649,419, Cl. 380-20.000.

Capes, Charles E.; Coleman, Richard D.; Thayer, William L.; and Puddington, Ira E., to Canadian Patents and Development Limited. Method of breaking down chemisorption bond of clay-containing heavy oil water emulsions. 4,648,962, Cl. 208-188.000.

Capintec, Inc.: *See*—
Suzuki, Arata, 4,649,276, Cl. 250-361.00R.

Caraluzzi, Mark: *See*—
Cardullo, Mario; Caraluzzi, Mark; and Schildbach, Peter, 4,649,056, Cl. 426-509.000.

Carbomedics, Inc.: *See*—
Ellis, Willard H., 4,648,391, Cl. 128-132.00R.

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Schmidt, Roger A., 4,649,173, Cl. 524-539.000.

Carlin, Joseph T.; and Haferkamp, Gilbert L., to Texaco Inc. Method of increasing enhanced oil recovery by using a novel low sulfonate phase in the polymer slug. 4,648,452, Cl. 166-274.000.
Carlson, Alden J.; and Bhaskar, Kasi S., to John Fluke Mfg. Co., Inc. Computer-produced circuit board. 4,649,497, Cl. 364-491.000.
Carlson, Franklin J. Manhole lid seal. 4,648,740, Cl. 404-25.000.
Carlson, Lee R.; Hegedus, Denes A.; Jarrett, Steven M.; Miller, Michael F.; Riley, Martin E.; and Wright, David L., to Spectra-Physics, Inc. Gas laser construction. 4,649,547, Cl. 372-61.000.
Carlson, Melvin C.; and Dean, Raymond H. Control installation for variable volume air diffusers. 4,648,552, Cl. 236-49.000.
Carlson, Steven B.: *See*—
Pearlman, Gordon W.; and Carlson, Steven B., 4,649,323, Cl. 315-307.000.
Carmichael, Tracy J. Multi-level board game. 4,648,601, Cl. 273-241.000.
Caron, Bernard G.: *See*—
Ashman, John J.; and Caron, Bernard G., 4,648,688, Cl. 350-96.200.
Carpenter, Denis D.: *See*—
Oltman, John E.; Dopp, Robert B.; and Carpenter, Denis D., 4,649,090, Cl. 429-29.000.
Carpentier, Alain; Carpentier, Sophie; and Nashef, Aws S., to American Hospital Supply Corporation. Implantable biological tissue and process for preparation thereof. 4,648,881, Cl. 623-11.000.
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Carrell, Ross M., to RCA Corporation. Articulated manipulation device. 4,648,588, Cl. 271-91.000.
Carrell, Ross M., to RCA Corporation. Terminal. 4,648,676, Cl. 339-97.00R.
Carrier Corporation: *See*—
Thompson, Kevin D.; Ballard, Gary W.; and Mamot, Robert M., 4,648,551, Cl. 236-49.000.
Carrington, James E.: *See*—
Bloom, Robert D.; Carrington, James E.; Ide, Richard A.; Traglia, Patrick J.; and Westcott, Gerald R., 4,649,501, Cl. 364-519.000.
Carroll, Robert, Jr. Long distance fishing system. 4,648,194, Cl. 43-4.500.
Carson Manufacturing Company, Inc.: *See*—
Carson, William H., 4,649,264, Cl. 235-54.00F.
Carson, William H., to Carson Manufacturing Company, Inc. Electronic voting machine. 4,649,264, Cl. 235-54.00F.
Carson, William W., to Millipore Corporation. Apparatus for converting rotational motion to linear motion. 4,648,285, Cl. 74-424.80C.
Cartier, Claude J.; Guilhem, Jean R. R.; Guilhem, Jacques R. J.; and Wenger, Roger L. L., to Societe Generale d'Etudes et de Materiels Industriels Navals et Informatiques. Apparatus for the treatment of oedema of members by pressure. 4,648,392, Cl. 128-160.000.
Casio Computer Co., Ltd.: *See*—
Naruki, Yukio; and Yasuda, Takeshi, 4,649,400, Cl. 346-76.0PH.
Ohta, Morio; and Tsuchiya, Shizuo, 4,649,404, Cl. 346-160.000.
Shibasaki, Sohei; Iwasaki, Yasumasa; Ono, Noriki; Arai, Koichi; Maruyama, Koji; and Shimanari, Tatsumi, 4,648,706, Cl. 355-43.000.
Takahashi, Hiroshi, 4,649,481, Cl. 364-405.000.
Casio Electronics Manufacturing Co., Ltd.: *See*—
Ohta, Morio; and Tsuchiya, Shizuo, 4,649,404, Cl. 346-160.000.
Shibasaki, Sohei; Iwasaki, Yasumasa; Ono, Noriki; Arai, Koichi; Maruyama, Koji; and Shimanari, Tatsumi, 4,648,706, Cl. 355-43.000.
Caskey, Kenneth D., to Halliburton Company. Retrieving mechanism. 4,648,445, Cl. 166-98.000.
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Fore, William M.; and Caskey, Kenneth D., 4,648,446, Cl. 166-123.000.
Cassey, Russell A., to Trigon Packaging Systems (NZ) Limited. Envelope with pouch and method of manufacture thereof. 4,648,860, Cl. 493-195.000.
Castelijns, Anna M. C. F.; and Aarts, Thomas M. G., to Stamicarbon B.V. Process for the preparation of 2-cyanomethylcyclohexanone. 4,649,211, Cl. 558-430.000.
Castner, Raymond P.; Olechovsky, David F.; Brown, Philip S.; Sinha, Susanta; Keller, Harold T.; and Cheng, Wenche W., to Westinghouse Electric Corp. Tube expansion apparatus. 4,649,493, Cl. 364-472.000.
Cattaneo, Sergio, to Honeywell Information Systems Italia. Armature group for mosaic printing head and related manufacturing method. 4,648,730, Cl. 400-124.000.
Cattani, Luciano, to Sauer, S.p.A. Device for shaping ice creams and food articles of creamy consistency. 4,648,829, Cl. 425-326.100.
Cavanna S.p.A.: *See*—
Francioni, Renzo, 4,648,504, Cl. 198-606.000.
Cel Co., Inc.: *See*—
Fox, Steve A.; Murray, Donald L.; and Dinkin, Frederick, 4,648,414, Cl. 132-43.00R.
Celleco AB: *See*—
Hermansson, Hans, 4,648,970, Cl. 210-327.000.
Central Sprinkler Corporation: *See*—
Pieczykolan, George S., 4,648,459, Cl. 169-38.000.
Centre National de la Recherche Scientifique (CNRS): *See*—
Cagan, Vladimir; and Guyot, Marcel, 4,649,495, Cl. 364-481.000.
Centro-Morgardshammar AB: *See*—
Lundgren, Nils L., 4,648,297, Cl. 83-27.000.
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Cessna Aircraft Company, The: *See*—
Voisard, Walter B., 4,648,798, Cl. 416-48.000.
Cetus Corporation: *See*—
Blakemore, Judith I.; Hanamoto, Mark S.; and Williams, Fred G., 4,648,529, Cl. 221-1.000.
Champion International Corporation: *See*—
Brenholdt, Irving R., 4,648,712, Cl. 356-73.000.
Chan, David C. K., to Chevron Research Company. Herbicidal N-oxadiazolylmethyl-, N-thiadiazolylmethyl-, and N-triazolylmethyl-substituted alpha-haloacetanilide. 4,648,897, Cl. 71-90.000.
Chan, Hakchill: *See*—
Kay, Robert E.; Chan, Hakchill; Ju, Fred; and Bray, Burton A., 4,648,917, Cl. 148-175.000.
Chang, Victor A.; Reyes, Angel A.; Jegers, Martin P.; and Valise-Jean, Frantz, to Motorola, Inc. Cadmium negative electrode. 4,649,092, Cl. 429-217.000.
Chant, Nigel A.; Mosse, Richard W. E.; and Bunce, Kevin, to Liquipak International B.V. Valve device for controlling liquid flow. 4,648,421, Cl. 137-312.000.
Chaplin, Gary F.: *See*—
Baran, Walter J., Jr.; Chaplin, Gary F.; and Laurello, Vincent P., 4,648,792, Cl. 415-139.000.
Chapnick, Bernard. Method of forming a shoe insert. 4,648,923, Cl. 156-82.000.
Charbonnages de France: *See*—
Delebarre, Arnaud, 4,648,330, Cl. 110-263.000.
Charlebois, Leonard J.: *See*—
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Charles Stark Draper Laboratory, Inc., The: *See*—
Dawson, Thomas F.; and Ewing, Paul C., Jr., 4,648,211, Cl. 51-165.00R.
Dawson, Thomas F.; Ewing, Paul C., Jr.; Dafnoulelis, Christos V.; and Martin, Jacob H., 4,648,212, Cl. 51-165.00R.
Charlton, Steven C.; Hemmes, Paul; and Lau, Arthur L. Y., to Miles Laboratories, Inc. Ion test means having a hydrophilic carrier matrix. 4,649,123, Cl. 436-79.000.
Charpentier, Jacques: *See*—
Jacquot, Alain; and Charpentier, Jacques, 4,648,294, Cl. 82-4.00R.
Chatterson, Louis M., to Haworth, Inc. Compressor unit for filing unit. 4,648,527, Cl. 220-22.400.
Chemische Werke Huls Aktiengesellschaft: *See*—
Gras, Rainer, 4,649,067, Cl. 427-388.200.
Chemring PLC: *See*—
Butters, Brian C. F.; and Pollicott, Ian D., 4,649,076, Cl. 428-361.000.
Chen, Augustin T.; and Onder, Kemal, to Dow Chemical Company, The. Polyamide-poly-carbonate block copolymers. 4,649,180, Cl. 525-462.000.
Chen, James Y., to Belco Pollution Control Corporation. Integral water demineralizer system and method. 4,648,976, Cl. 210-678.000.
Chen, Jiann H.: *See*—
Labes, Mortimer M.; and Chen, Jiann H., 4,649,038, Cl. 423-364.000.
Chen, Nai Y.: *See*—
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Chen, Zhi-Xiong: *See*—
Fang, Chang-Shui; Xi, Yao; Chen, Zhi-Xiong; Bhalla, Amar S.; and Cross, Leslie E., 4,648,991, Cl. 252-1.000.
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Irio, Francis; Chene, Richard; and Uzac, Pierre, 4,648,157, Cl. 24-23.00R.
Cheng, Wenche W.: *See*—
Castner, Raymond P.; Olechovsky, David F.; Brown, Philip S.; Sinha, Susanta; Keller, Harold T.; and Cheng, Wenche W., 4,649,493, Cl. 364-472.000.
Sinha, Susanta; Brown, Philip S.; Harman, Douglas G.; Keller, Harold T.; Olechovsky, David F.; and Cheng, Wenche W., 4,649,492, Cl. 364-472.000.
Chevron Research Company: *See*—
Buckley, Thomas F., III; and Wollenberg, Robert H., 4,648,886, Cl. 44-63.000.
Chan, David C. K., 4,648,897, Cl. 71-90.000.
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Jacobson, Robert L.; and Jossens, Lawrence W., 4,648,961, Cl. 208-138.000.
Chicago Bridge & Iron Company: *See*—
Cutler, Donald R., 4,648,968, Cl. 210-218.000.
Evans, Timothy J.; and Kooy, Richard J., 4,648,864, Cl. 494-37.000.
Childress, Jeffrey S., to General Electric Company. Dispatch overdialing for inter-group and other added calling/called access to communications channels in a trunked radio communications system. 4,649,567, Cl. 455-17.000.
Chiron, Guy; and Vidal, Jean-Charles, to Commissariat a l'Energie Atomique. Device for automatically compensating the magnetism of drill string members. 4,649,349, Cl. 324-346.000.
Chorley, William; Redding, Robert; and Fries, Christopher, to Keycon Electronic Publishing. Method and apparatus for retrieving remotely located information. 4,649,533, Cl. 370-58.000.
Chubb Australia Limited: *See*—
McCulloch, Alister L., 4,648,460, Cl. 169-57.000.
Chung, Paul W.; Matick, Richard E.; and Ling, Daniel T., to International Business Machines Corp. Dynamic row buffer circuit for DRAM. 4,649,516, Cl. 364-900.000.

Chutjian, Ara; and Orient, Otto J., to United States of America, National Aeronautics and Space Administration. Variable energy, high flux, ground-state atomic oxygen source. 4,649,273, Cl. 250-251.000.
Chutjian, Ara; Orient, Otto J.; and Aladzhadzhyan, Samuel H., to United States of America, National Aeronautics and Space Administration. Generation of intense negative ion beams. 4,649,278, Cl. 250-423.00R.
Ciba-Geigy AG: *See*—
Postle, Stephen R.; Elton, Peter J.; and Gregory, David P., 4,649,026, Cl. 422-56.000.
Ciba-Geigy Corporation: *See*—
Brunner, Hans-Georg, 4,648,896, Cl. 71-90.000.
Darms, Roland; and Monnier, Charles E., 4,649,181, Cl. 525-524.000.
Durr, Dieter, 4,649,212, Cl. 560-21.000.
Gallay, Jean-Jacques; and Schweizer, Ernst, 4,649,149, Cl. 514-367.000.
Gass, Karl; Fory, Werner; Meyer, Willy; and Topfl, Werner, 4,648,899, Cl. 71-93.000.
Graf, Gregor; Holzle, Gerd; and Reinert, Gerhard, 4,648,992, Cl. 540-124.000.
Koci, Zdenek, 4,648,884, Cl. 8-527.000.
Kosiorek, Raymond S.; and Gatechair, Leslie R., 4,649,062, Cl. 427-54.100.
Martin, Henry; and Fricker, Urs, 4,648,895, Cl. 71-88.000.
Muller, Rolf; Niederer, Hans; and Hahn, Othmar, 4,648,994, Cl. 260-380.000.
Podder, Nitya G., 4,648,883, Cl. 8-527.000.
Ravichandran, Ramanathan; Malherbe, Roger F.; and Seltzer, Raymond, 4,649,221, Cl. 564-300.000.
von Sprecher, Andreas; Ernest, Ivan; Main, Alan J.; and Beck, Andreas, 4,649,215, Cl. 560-152.000.
Clarisse, Christian; Riou nee Meston, Marie-Therese; and Auregan, Marcel. Process for the preparation of metal diphthalocyanines. 4,649,195, Cl. 540-143.000.
Clark, Charles A., Jr.: *See*—
Aires, Ramon H.; Clark, Charles A., Jr.; Ito, Roy A.; and Hackett, Kenneth R., 4,649,385, Cl. 379-57.000.
Clark, Douglas C.: *See*—
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Clark, Susan A. Coordinated nursing slip and bra. 4,648,404, Cl. 128-455.000.
Cleary, Cynthia A.: *See*—
Cleary, Vincent J., Jr., 4,648,550, Cl. 232-25.000.
Cleary, Vincent J., Jr., to Cleary, Cynthia A. Tamperproof mailbox assembly. 4,648,550, Cl. 232-25.000.
Cleaver, John R. A.; and Ahmed, Haroon, to Dubilier Scientific Limited. Ion beam species filter and blanker. 4,649,316, Cl. 313-361.100.
Clement, Henry: *See*—
Lassaux, Jean; and Clement, Henry, 4,649,335, Cl. 324-52.000.
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Mouhot, Frederic; Barnabe, Jean-Pierre; Hoblingre, Andre ; and Clerc, Michel, 4,648,624, Cl. 280-775.000.
Clevite Industries Inc.: *See*—
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Clorox Company, The: *See*—
Smith, William L.; and Munk, Barbara H., 4,648,987, Cl. 252-559.000.
CMI, Inc.: *See*—
Talbot, Douglas C., 4,649,027, Cl. 422-84.000.
Coal-O-Matic PVBA: *See*—
Melis, Florentinus; Verbergt, Jan; and Van Rooy, Willy, 4,649,260, Cl. 219-267.000.
Coffey, Cynthia L.: *See*—
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Coffey, John W.: *See*—
Aig, Edward R.; Coffey, John W.; Lovey, Allen J.; and Rosenberger, Michael, 4,648,996, Cl. 260-410.90R.
Cogbill, Randall B.: *See*—
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Cohen, Jerome B.: *See*—
Rinik, Christine; Cohen, Jerome B.; and Hilliard, John E., 4,649,556, Cl. 378-71.000.
Colberg, Horst; and Mayer, Udo, to BASF Aktiengesellschaft. Cationic phthalocyanine dyes. 4,648,993, Cl. 540-134.000.
Cole, Ronald A.: *See*—
Rusconi, John B.; and Cole, Ronald A., 4,648,338, Cl. 112-180.000.
Coleman, Richard D.: *See*—
Capes, Charles E.; Coleman, Richard D.; Thayer, William L.; and Puddington, Ira E., 4,648,962, Cl. 208-188.000.
Coleman, Richard K., to Exxon Production Research Co. Method and apparatus for erecting offshore platforms. 4,648,751, Cl. 405-209.000.
Colgate-Palmolive Company: *See*—
Broze, Guy; and Delvenne, Jean-Paul, 4,648,983, Cl. 252-135.000.
Collette, Wayne N., to Continental Pet Technologies, Inc. Preform for use in blow molding a container subjected to hot filling and closed by a rotatable closure, and method of an apparatus for making the same. 4,649,068, Cl. 428-35.000.
Collins, Geoff; and Juurmaa, Kimmo, to Oy Wartsila Ab. Arrangement in vessels. 4,648,342, Cl. 114-40.000.
Colombo, Sergio: *See*—
Terra, Luigi; Sada, Edoardo; and Colombo, Sergio, 4,649,277, Cl. 250-363.00S.
Colt Industries Operating Corp: *See*—
Fuller, William A., 4,648,559, Cl. 239-585.000.
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Bergner, William J., 4,648,473, Cl. 180-65.800.
Columbia University, The Trustees of: *See*—
Manning, Maurice; and Sawyer, Wilbur H., 4,649,130, Cl. 514-11.000.
Combustion Engineering, Inc.: *See*—
Alexander, Jack L., 4,648,806, Cl. 417-238.000.
Couture, Michael V., 4,649,017, Cl. 376-272.000.
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Composite Container Corporation: *See*—
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Willim, Fritz, 4,648,439, Cl. 164-480.000.
Conger, Stephen W., Sr. Dental polisher combining pressurized fluid and abrasive flow. 4,648,840, Cl. 433-125.000.
Conner, James M.; Harden, Daniel K.; and Genaro, Donald M., to Henry Dreyfuss Associates. Tampon system and method. 4,648,867, Cl. 604-14.000.
Conoco Inc.: *See*—
Rutledge, Gerald D., 4,649,034, Cl. 423-244.000.
Construction Robotics, Inc.: *See*—
Deike, Robert F., 4,648,609, Cl. 279-19.100.
Continental Pet Technologies, Inc.: *See*—
Collette, Wayne N., 4,649,068, Cl. 428-35.000.
Cook, Harold T., Jr.: *See*—
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Cooper Industries: *See*—
Alender, Wolfgang J.; Anders, Heinz-Gerhard; and Leuthner, Hermann J., 4,648,282, Cl. 73-862.230.
Cooper, Leonard W. Shirt with adjustable collar opening. 4,648,137, Cl. 2-141.00R.
Copytex GmbH Sicherheitssysteme: *See*—
Stockburger, Hermann; and Bauer, Siegfried, 4,649,265, Cl. 235-380.000.
Cornell Research Foundation, Inc.: *See*—
Eastman, Lester F., 4,649,405, Cl. 357-3.000.
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Corning Glass Works: *See*—
Goepfert, Serge P. P.; Renault, Serge A. M.; and Roger, Francoise M. M., 4,648,925, Cl. 156-153.000.
Coroneos, James H. Apparatus for packing and forming ground beef. 4,648,153, Cl. 17-32.000.
Cortez, Fermin M.: *See*—
Bertram, James L.; Walker, Louis L.; McCrary, Avis L.; and Cortez, Fermin M., 4,649,188, Cl. 528-165.000.
Couarc'h, Michel F. E.; Bessouat, Roger; Lafaye, Marc R. R.; and Bernet, Robert R. E., to Manutair Moller; and Stein Industrie. Device for reinjecting flown-off particles into a solid fuel boiler. 4,648,329, Cl. 110-245.000.
Courville, George V.: *See*—
Bonis, Laszlo J.; Courville, George V.; and Opland, Samuel, 4,649,007, Cl. 264-148.000.
Couture, Michael V., to Combustion Engineering, Inc. Nuclear fuel rod transfer canister having corrugated funnel. 4,649,017, Cl. 376-272.000.
Cowart, Betty J.: *See*—
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Cox, David C.; and Marx, Thomas O., to Atwood Vacuum Machine Company. Seat adjuster responsive to tilting of seat back. 4,648,657, Cl. 297-341.000.
CP Pumpen AG: *See*—
Hauenstein, Ernst, 4,648,808, Cl. 417-353.000.
CPC International Inc.: *See*—
Datta, Rathin; and Lemmel, Steven A., 4,649,112, Cl. 435-136.000.
Crager, Bruce L.: *See*—
Watkins, Bruce J.; Regan, Albert M.; Crager, Bruce L.; Fox, Gary L.; and Houlgrave, Robert C., 4,648,747, Cl. 405-195.000.
Crain, Steven L.; and Miller, Homer W., to Honeywell Information Systems Inc. Apparatus providing improved diagnosability. 4,649,539, Cl. 371-25.000.
Crane, Ronald C. Local computer network transceiver. 4,649,548, Cl. 375-7.000.
Crawshay, Richard: *See*—
Hradil, John H.; Bottomley, Frank; and Crawshay, Richard, 4,648,776, Cl. 414-565.000.
Crinos Industria Farmacobiologica SpA: *See*—
Bonomini, Vittorio, 4,649,134, Cl. 514-44.000.
Cross, Leslie E.: *See*—
Fang, Chang-Shui; Xi, Yao; Chen, Zhi-Xiong; Bhalla, Amar S.; and Cross, Leslie E., 4,648,991, Cl. 252-1.000.
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Poeppelmeier, Kenneth R.; Funk, Walter G.; Steger, John J.; Fung, Shun C.; Cross, Virginia R.; and Kao, Jar-Lin, 4,648,960, Cl. 208-138.000.

Crowe, Dale A.: *See*—
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Cubbison, Richard J., Jr., to AT&T Information Systems Inc. Voltage divider circuit. 4,649,468, Cl. 363-62.000.
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Toth, John E.; and Hempfling, Ronald L., 4,648,327, Cl. 109-57.000.
Culbertson, W. Bruce: *See*—
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Cummins Engine Company, Inc.: *See*—
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Cutler, Donald R., to Chicago Bridge & Iron Company. Floating cover tank with guides for vertical displacement of the cover. 4,648,968, Cl. 210-218.000.
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Cycon, Michael F., Jr.: *See*—
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Dainippon Ink and Chemicals, Inc.: *See*—
Tanaka, Hideo; Ohhashi, Kuniyoshi; Gomi, Tatsuya; and Dobashi, Tomoyuki, 4,649,054, Cl. 426-397.000.
Dainippon Pharmaceutical Co., Ltd.: *See*—
Matsumoto, Jun-ichi; Miyamoto, Teruyuki; Uno, Hitoshi; and Nakamura, Shinichi, 4,649,144, Cl. 514-300.000.
Dainippon Screen Mfg. Co., Ltd.: *See*—
Yamada, Mitsuhiko; and Kitamura, Hideaki, 4,649,500, Cl. 364-518.000.
Daino, Grant O. Stained glass cremation urn with foam and paper liner. 4,648,162, Cl. 27-1.000.
Daiwa Can Company, Limited: *See*—
Kai, Takayuki, 4,649,251, Cl. 219-64.000.
Daleco, Inc.: *See*—
Greenbacker, Dale E., 4,648,382, Cl. 126-348.000.
Damiano, Michael A.; and Schmerda, Richard F., to Eaton Corporation. DC or AC solid state switch with improved line-derived control circuit power supply. 4,649,302, Cl. 307-584.000.
Dana-Farber Cancer Institute, Inc.: *See*—
Schlossman, Stuart F.; and Morimoto, Chikao, 4,649,106, Cl. 435-7.000.
Daniels, Timothy R.: *See*—
Deaton, Thomas P.; and Daniels, Timothy R., 4,648,199, Cl. 43-100.000.
Miller, Daniel R.; Daniels, Timothy R.; and Deaton, Thomas P., 4,648,200, Cl. 43-102.000.
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Michel, Thomas J., 4,648,189, Cl. 40-546.000.
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Daus, John J., Jr.; and James, Henry E., to Anchor Industries, Inc. Corner connector assembly. 4,648,734, Cl. 403-170.000.
David, Bernard; and Tetard, Roger. Armoured V-shaped belt with metal contacts. 4,648,857, Cl. 474-272.000.
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Panek, Edward J.; and Davis, Pauls, 4,649,224, Cl. 568-624.000.
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Johnstone, Thomas O.; and Dawe, Thomas W., 4,649,008, Cl. 264-177.100.
Dawick, John K.: *See*—
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Meadows, Roger D.; Rush, James B.; and Bryan, James S., 4,648,628, Cl. 285-24.000.
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Geiser, Jens; and Viaud, Jean, 4,648,239, Cl. 56-341.000.
Stephenson, Dwight B.; and Wendel, Glenn R., 4,648,803, Cl. 417-53.000.
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Degnan, Thomas F., Jr.; and Chen, Nai Y., to Mobil Oil Corporation. Process for hydrogenative reactivation of spent catalysts. 4,649,127, Cl. 502-33.000.
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Deike, Robert F., to Construction Robotics, Inc. Driver tool. 4,648,609, Cl. 279-19.100.
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Sokol, Steve, 4,648,572, Cl. 248-206.200.
Deutsch, Arnim; and Ruyten, Henricus M., to U.S. Philips Corporation. Switching mechanism for the deck of a magnetic-tape-cassette apparatus. 4,649,446, Cl. 360-105.000.
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DeVolpi, Alexander, to United States of America, Energy. Monitoring system for a liquid-cooled nuclear fission reactor. 4,649,015, Cl. 376-258.000.
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Sheafor, Stephen J.; and Weng, Ken K. S., 4,649,384, Cl. 340-825.030.
Diaz, Stephen H.; Debbaut, Christian A. M.; Humphries, William H.; Lawrence, Alvah A.; Ragland, Glen W.; and Shimirak, Gerald L., to Raychem Corp. Protection of cable splice. 4,648,919, Cl. 156-48.000.
Diehl GmbH & Co.: *See*—
Furst, Wilhelm; Rudensauer, Werner; and Siebert, Rainer, 4,648,320, Cl. 102-210.000.
Diekman, Robert L.; and Downing, V. Daniel, to Huffy Corporation. Frame joint construction for bicycles and the like. 4,648,616, Cl. 280-281.00R.
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Dinkin, Frederick: *See*—
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Dobrowolski, Jerzy A.; and Whitehead, Lorne A., to Canadian Patents and Development Limited. Viewing angle color sensitive lighting accessory. 4,649,462, Cl. 362-2.000.
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Doki, Yoshikuni; Fujiwara, Masatoshi; Shiga, Tatsuhide; Shono, Yohsuke; Tanaka, Mikio; and Tsuruoka, Yoshihiro, to Yamatake-Honeywell Co. Ltd. Explosion-proof electro-displacement converter device. 4,649,359, Cl. 335-222.000.
Dolengowski, George A., to Exxon Production Research Co. Multiple-port, multiple-chamber, tuned air-powered subsea seismic source. 4,648,479, Cl. 181-120.000.
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Dolman, Hendrik; and Kuipers, Johannes, to Duphar International Research B.V. Fungicidal and/or bactericidal compositions containing nitrothiophenes, and use thereof. 4,649,154, Cl. 514-445.000.
Dolman, James; and Dolman, Gerri. Method of preventing moisture accumulation and mildew. 4,648,186, Cl. 34-9.000.
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Donn Incorporated: *See*—
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Dorumsgaard, John A.; and Amerson, Roger H., to Methods, Inc. Load/unload apparatus for disc-like workpieces. 4,648,774, Cl. 414-416.000.
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Dougherty, John F. Fastener for a lace or rope or the like. 4,648,159, Cl. 24-117.000.
Dougherty, Thomas J.; Potter, William R.; and Weishaupt, Kenneth R., to Health Research, Inc. Drugs comprising porphyrins. 4,649,151, Cl. 514-410.000.
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Chen, Augustin T.; and Onder, Kemal, 4,649,180, Cl. 525-462.000.
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Dresser Industries, Inc.: *See*—
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Drury, Michael J.: *See*—
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Dugan, Thomas J. Sliding door lock. 4,648,252, Cl. 70-100.000.
Dugan, William P., to General Dynamics, Pomona Division. Fine line circuitry probes and method of manufacture. 4,649,338, Cl. 324-158.00P.
Dulin, Casner A. Penetrating oil and method of preparation. 4,648,981, Cl. 252-32.70E.
Dunkley, Michael W.; and Stainton, John E., to Eaton Corporation. Semi-automatic mechanical transmission control. 4,648,290, Cl. 74-866.000.
Dunsworth, Charles L., to Metalines, Inc. Hygroscopic composition for fire resistant expansion joint cover. 4,649,129, Cl. 502-407.000.
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Garlick, Russell K.; and Jirousek, Ludek, 4,649,039, Cl. 424-1.100.
Duppong, Denis E.; McGrew, Bernard L.; and Decker, Ramsay P., to FMC Corporation. Apparatus for detecting power lines. 4,649,375, Cl. 340-660.000.

Durand, Bernard. Speed measuring device for a helicopter. 4,648,269, Cl. 73-178.00H.
Durant, Graham J.; Ganellin, Charon R.; and Vickers, Margaret R., to SmithKline & French Laboratories Limited. Pharmaceutical compositions. 4,649,138, Cl. 514-232.000.
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Durr, Dieter, to Ciba-Geigy Corporation. Novel phenoxyphenylamino acid derivatives, the production thereof, compositions containing them and use thereof. 4,649,212, Cl. 560-21.000.
Duve, John P., to Eaton Corporation. Program timer with variable time delay. 4,649,239, Cl. 200-38.00R.
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Rule, Mark; Larkins, Thomas H., Jr.; Lane, Donald W.; and Steinmetz, Guy R., 4,649,216, Cl. 562-406.000.
Eastman, Lester F., to Cornell Research Foundation, Inc. Electron ballistic injection and extraction for very high efficiency, high frequency transferred electron devices. 4,649,405, Cl. 357-3.000.
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Eden, James G.; and Geohegan, David B., to United States of America, Air Force. Photoionization technique for growth of metallic films. 4,649,059, Cl. 427-38.000.
Edwards, Robert C.; and Udovich, Carl A., to Standard Oil Company (Indiana). Process for the manufacture of maleic anhydride utilizing catalysts reactivated with alkyl esters of orthophosphoric acid in the presence of water. 4,649,205, Cl. 549-260.000.
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Eisenhawer, Stephen; Mulac, Anthony J.; Donaldson, A. Burl; and Fox, Ronald L., to Enhanced Energy Systems. Steam generator having a high pressure combustor with controlled thermal and mechanical stresses and utilizing pyrophoric ignition. 4,648,835, Cl. 431-4.000.
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Davis, Robert C.; Gibson, John W.; Skinner, Daniel S., Jr.; Dearth, Timothy E.; and Harris, Dale C., 4,649,042, Cl. 424-438.000.
Elkins, Johnny C. Adjustable gun rack. 4,648,516, Cl. 211-64.000.
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Ellis, Willard H., to Carbomedics, Inc. Stabilizer for percutaneous medical devices. 4,648,391, Cl. 128-132.00R.
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Elmec Corporation: *See—*
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Emrich, Helmut; and Wenzel, Jurgen, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Method and apparatus for aligning and feeding sheets for printing presses. 4,648,589, Cl. 271-236.000.
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Endo, Takayoshi; Sugiyama, Toshimasa; Murofushi, Satoru; and Yagi, Sakai, to Yazaki Corporation. Wire-harness for automobiles. 4,648,673, Cl. 339-97.00R.
Endoh, Hiroyuki: *See—*
Ikenoue, Yutaka; Endoh, Hiroyuki; Ishii, Kei; and Suzuki, Keitaro, 4,648,903, Cl. 75-230.000.
Endoh, Yasuyuki: *See—*
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Energiagazdalkodasi Intezet: *See—*
Szucs, Laszlo; Szabo, Jozsef; and Tasnadi , Csaba, 4,648,443, Cl. 165-181.000.
Engan, Helge, to Siemens Aktiengesellschaft. Surface acoustic wave convolver arrangement with closely spaced impedance matched input transducers. 4,649,309, Cl. 364-821.000.
Engelhaupt, Darell E.: *See—*
George, Ronald W.; Ohmart, James G.; Irlesberger, Kurt H.; Michaud, Lawrence L.; and Engelhaupt, Darell E., 4,648,944, Cl. 204-1.00T.
Enhanced Energy Systems: *See—*
Eisenhawer, Stephen; Mulac, Anthony J.; Donaldson, A. Burl; and Fox, Ronald L., 4,648,835, Cl. 431-4.000.
Ennaoui, Ahmed: *See—*
Tributsch, Helmut; Ennaoui, Ahmed; Jaegermann, Wolfram; and Fiechter, Sebastian, 4,649,227, Cl. 136-252.000.
Entek Manufacturing Inc.: *See—*
Johnson, Peter E.; and Young, James, 4,648,417, Cl. 134-105.000.
Erdelitsch, Herbert; Gaudich, Werner; and Hecht, Walter, to SWF Auto-Electric GmbH. Steering column switch for motor vehicles. 4,648,728, Cl. 384-537.000.
Erdman, Timothy R., to Chevron Research Company. Hydrocarbon soluble nitrogen containing dispersant - fluorophosphoric acid adducts. 4,648,980, Cl. 252-32.500.
Erickson, Robert E.: *See—*
Scott, Laurie J.; Erickson, Robert E.; and Wallace, Theodore C., 4,649,164, Cl. 521-149.000.
Ericson, Kjell Y.: *See—*
Gyllang, Hans E.; Ekblom, Bjorn T.; Wesshagen, Vera V.; and Ericson, Kjell Y., 4,649,051, Cl. 424-154.000.
Erndt, Hans: *See—*
Palloch, Herbert; and Erndt, Hans, 4,648,855, Cl. 474-144.000.
Ernest, Ivan: *See—*
von Sprecher, Andreas; Ernest, Ivan; Main, Alan J.; and Beck, Andreas, 4,649,215, Cl. 560-152.000.
Escaillas, Gerard: *See—*
Herbulot, Jean; and Escaillas, Gerard, 4,648,498, Cl. 192-94.000.
Eschard, Gilbert, to U.S. Philips Corporation. Electron multiplier element, electron multiplier device comprising said multiplying element, and the application to a photomultiplier tube. 4,649,314, Cl. 313-103.0CM.
Esmil B.V.: *See—*
Goedhart, Cornelis, 4,648,332, Cl. 110-346.000.
Esser, Gerhard. Device for dispensing liquids. 4,648,534, Cl. 222-373.000.
Esser, Leonard J. M.: *See—*
Boudewijns, Arnoldus J. J.; and Esser, Leonard J. M., 4,649,554, Cl. 377-60.000.
ETA S.A., Fabriques d'Ebauches: *See—*
Mock, Elmar; and Muller, Jacques, 4,648,722, Cl. 368-294.000.
Etablissements Caillau: *See—*
Irio, Francis; Chene, Richard; and Uzac, Pierre, 4,648,157, Cl. 24-23.00R.

Ethyl Corporation: *See—*
Ranken, Paul F.; and Ramachandran, Venkataraman, 4,649,202, Cl. 546-348.000.

Evans, Edward R.: *See—*
Osmera, Miroslav S.; Bella, Anton; Kallin, Fredrik L. N.; and Evans, Edward R., 4,648,591, Cl. 271-305.000.

Evans, George D., II: *See—*
Hardwick, Martha K.; Pike, Kelly A.; Evans, George D., II; Edwards, Ronald; and Norman, Jacob J., 4,648,868, Cl. 604-32.000.

Evans, Timothy J.; and Kooy, Richard J., to Chicago Bridge & Iron Company. Centrifugal separator and method of separating buoyant particles from a liquid. 4,648,864, Cl. 494-37.000.

Evstropiev, Konstantin K., deceased: *See—*
Gaprindashvili, Khanzerifa I.; Kogan, Vadim E.; Kekelia, Dzhemal I.; Pronkin, Alexei A.; Salukvadze, Nana A.; Bakuradze, Georgy V.; and Evstropiev, Konstantin K., deceased, 4,649,126, Cl. 501-43.000.

Evstropieva, Galina I., Sergei K. Evstropiev, administrators: *See—*
Gaprindashvili, Khanzerifa I.; Kogan, Vadim E.; Kekelia, Dzhemal I.; Pronkin, Alexei A.; Salukvadze, Nana A.; Bakuradze, Georgy V.; and Evstropiev, Konstantin K., deceased, 4,649,126, Cl. 501-43.000.

Ewing, Paul C., Jr.: *See—*
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Exxon Production Research Co.: *See—*
Avicola, Kenneth, 4,649,529, Cl. 367-149.000.
Coleman, Richard K., 4,648,751, Cl. 405-209.000.
Dolengowski, George A., 4,648,479, Cl. 181-120.000.
Guy, Arthur L.; and Glasscock, Maynard S., 4,648,752, Cl. 405-217.000.
Lamb, Walter J.; and Kunze, Kenneth R., 4,648,456, Cl. 166-307.000.
Nagra, Surjit S.; and Strilchuk, Andrew R., 4,648,453, Cl. 166-281.000.
Thompson, Arthur H.; and Katz, Alan J., 4,648,261, Cl. 73-38.000.
Winbow, Graham A.; and Baker, Lawrence J., 4,649,526, Cl. 367-35.000.

Exxon Research & Engineering Co.: *See—*
Gardner, Irwin J.; and Fusco, James V., 4,649,178, Cl. 525-306.000.
McMath, Henry G., Jr., 4,648,965, Cl. 208-411.000.
Poeppelmeier, Kenneth R.; Funk, Walter G.; Steger, John J.; Fung, Shun C.; Cross, Virginia R.; and Kao, Jar-Lin, 4,648,960, Cl. 208-138.000.
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F. Wieland Elektrische Industrie GmbH: *See—*
Schuir, Alexander; and Schrauder, Franz, 4,648,184, Cl. 33-18.100.

Faijersseon, Sven I.: *See—*
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Fairchild Semiconductor Corporation: *See—*
Krishna, Surinder; and Egan, Kulwant, 4,648,909, Cl. 148-1.500.
Vazehgoo, Farhad, 4,649,297, Cl. 307-456.000.

Falter, Ronald C.: *See—*
Alexander, Robert H.; Lawson, John R.; and Falter, Ronald C., 4,648,756, Cl. 408-9.000.

Familletti, Philip C., to Hoffmann-La Roche Inc. Air lift bioreactor. 4,649,117, Cl. 435-313.000.

Fanelli, Anthony J.: *See—*
Marsh, Gary B.; Fanelli, Anthony J.; Armor, John N.; and Zambri, Patrick M., 4,649,037, Cl. 423-338.000.

Fanelli, Ottorino, to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A. Pharmaceutical composition comprising L-carnitine for the treatment of impaired cardiac function. 4,649,159, Cl. 514-556.000.

Fang, Chang-Shui; Xi, Yao; Chen, Zhi-Xiong; Bhalla, Amar S.; and Cross, Leslie E., to Research Corporation. Pyroelectric crystals with high figures of merit. 4,648,991, Cl. 252-1.000.

Fanuc Limited: *See—*
Obara, Haruki, 4,649,252, Cl. 219-69.00W.

Fattom, Ali: *See—*
Shilo, Moshe; and Fattom, Ali, 4,649,110, Cl. 435-68.000.

Faulkner, James V., Jr.: *See—*
Kennon, Jerry M.; Faulkner, James V., Jr.; and York, Theodore H., 4,649,569, Cl. 455-67.000.

Feld, Michael S.: *See—*
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Feldkircher Wire Fabricating Co., Inc.: *See—*
Worzek, Michael, 4,648,203, Cl. 47-32.000.

Felix, Arthur M.; Heimer, Edgar P.; and Mowles, Thomas F., to Hoffmann-La Roche Inc. Growth hormone releasing factor analogs. 4,649,131, Cl. 514-12.000.

Fennel, Helmut; and Wupper, Hans, to Alfred Teves GmbH. Circuit configuration for a slip-controlled vehicle brake system. 4,648,662, Cl. 303-92.000.

Ferguson, Barry W., to Bow Valley Industries Ltd.; Bow Valley Resource Services Ltd.; and Canarctic Ventures Ltd. Method and apparatus for constructing an artificial island. 4,648,749, Cl. 405-205.000.

Ferguson, Keith T., to E. R. Squibb & Sons, Inc. Ostomy bag coupling. 4,648,875, Cl. 604-339.000.

Ferrand, Gerard; Barbanton, Jacques; and Depin, Jean-Claude, to Lipha, Lyonnaise Industrielle Pharmaceutique. 5,6-Dihydro-4H-cyclopenta(b)thiophene-6-carboxylic acids, preparation processes and medicines containing them. 4,649,153, Cl. 514-443.000.

Ferranti Subsea Systems, Ltd.: *See—*
Fitzgibbons, Michael R., 4,648,748, Cl. 405-195.000.

Ferraro, Argelo, to General Electric Company. Gate capacitance latch for DC to AC converters. 4,649,321, Cl. 315-224.000.

Ferro, Alberto: *See—*
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Ferson, Isadore S.: *See—*
Briggs, Willard S.; Gant, Alan D.; Gupta, Parveen K.; and Ferson, Isadore S., 4,649,471, Cl. 364-200.000.

Fessler, Dieter: *See—*
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Feuerstein, Albert: *See—*
Aichert, Hans; Bauer, Volker; Feuerstein, Albert; and Ranke, Horst, 4,648,347, Cl. 118-720.000.

FFA Flug-und Fahrzeugwerke AG: *See—*
Gruninger, Edgar, 4,648,911, Cl. 148-6.270.

Fiala, Michael: *See—*
Reis, August K.; Fiala, Michael; and Heimann, Jochen R., 4,648,262, Cl. 73-57.000.

Fiechter, Sebastian: *See—*
Tributsch, Helmut; Ennaoui, Ahmed; Jaegermann, Wolfram; and Fiechter, Sebastian, 4,649,227, Cl. 136-252.000.

Figler, Alan A.: *See—*
Di Gianfilippo, Aleandro; Figler, Alan A.; Huang, Leon; and Warner, Donald, 4,648,430, Cl. 141-1.000.

Finsterwalder, Bernd: *See—*
Geiger, Michael; Finsterwalder, Bernd; and Kagerer, Franz, 4,648,172, Cl. 29-568.000.

Fischer, Artur. Fastening element. 4,648,767, Cl. 411-60.000.

Fischer, Hermann, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Rubber blanket attachment arrangement for an offset rotary printing machine. 4,648,318, Cl. 101-415.100.

Fischer, Juergen; Zeiner, Hartmut; Nissen, Dietmar; Heinz, Gerhard; and Neumann, Peter, to BASF Aktiengesellschaft. Fiber-reinforced materials. 4,649,080, Cl. 428-419.000.

Fister, Julius C.; and Breedis, John F., to Olin Corporation. Electrical component forming process. 4,649,083, Cl. 428-469.000.

Fitzgibbons, Michael R., to Ferranti Subsea Systems, Ltd. Clamp assembly. 4,648,748, Cl. 405-195.000.

Flow Industries, Inc.: *See—*
Hashish, Mohamed A.; Kirby, Michael J.; and Pao, Yih-Ho, 4,648,215, Cl. 51-439.000.

Flugan, David C., to Technicare Corporation. Radio frequency coils for nuclear magnetic resonance imaging systems. 4,649,348, Cl. 324-318.000.

Fluor Corporation: *See—*
Busch, Roger A., 4,648,848, Cl. 441-5.000.

Flutec Fluidtechnische Gerate GmbH: *See—*
Gensberger, Karl, 4,648,809, Cl. 417-366.000.

FMC Corporation: *See—*
Duppong, Denis E.; McGrew, Bernard L.; and Decker, Ramsay P., 4,649,375, Cl. 340-660.000.

Fohlen, George M.: *See—*
Achar, Bappalige N.; Fohlen, George M.; and Parker, John A., 4,649,189, Cl. 528-220.000.

Force Control Industries, Inc.: *See—*
Yater, Jerry L., 4,648,494, Cl. 192-18.00A.

Ford Aerospace & Communications Corporation: *See—*
Kay, Robert E.; Chan, Hakchill; Ju, Fred; and Bray, Burton A., 4,648,917, Cl. 148-175.000.

Ford Motor Company: *See—*
Henken, Fritz, 4,648,423, Cl. 137-494.000.
Janson, David A., 4,648,283, Cl. 74-477.000.
Moore, Thomas S., 4,648,492, Cl. 192-3.210.
Nuss, Sheldon E., 4,648,620, Cl. 280-689.000.
Tischer, Ragnar P.; Winterbottom, Walter L.; and Wroblowa, Halina S., 4,649,022, Cl. 419-24.000.

Ford, Norman C., Jr.; and Ware, Bennie R., to Langley-Ford Instruments a division of Coulter Electronics of N.E. Electrophoretic light scattering with plural reference beams, apparatus and method. 4,648,715, Cl. 356-344.000.

Fordyce, Donald E. Roaster frame or rack lifter. 4,648,379, Cl. 126-337.00R.

Fore, William M.; and Caskey, Kenneth D., to Halliburton Company. Wireline set/tubing retrieve packer type bridge plug. 4,648,446, Cl. 166-123.000.

Foreman, Arnal B., Jr.: *See—*
Bishop, Thomas R.; Peil, Archie W.; and Foreman, Arnal B., Jr., 4,648,447, Cl. 166-173.000.

Formhals, Charles: *See—*
Tarozzi, Richard A.; and Formhals, Charles, 4,648,512, Cl. 206-542.000.

Forster, Alfred; Riss, Helmut; and Walker, Heinz, to Siemens Aktiengesellschaft. Ultrasonic proximity switch. 4,649,527, Cl. 367-108.000.

Fortel, Inc.: *See—*
Kilstofte, Richard B., 4,649,562, Cl. 379-70.000.

Fortin, Conrad. Precision linoleum seam cutting tool. 4,648,181, Cl. 30-293.000.

Fortuna, Jon A.: *See—*
Davis, Wayne S.; Defibaugh, George R.; and Fortuna, Jon A., 4,648,665, Cl. 339-14.00R.

Fory, Werner: *See—*
Gass, Karl; Fory, Werner; Meyer, Willy; and Topfl, Werner, 4,648,899, Cl. 71-93.000.

Foster, John K., to Packaging Industries Group, Inc. Safety device. 4,648,641, Cl. 292-264.000.

Fox, Charles H.: *See*—
Mann, John P.; Levenstein, Victor M.; and Fox, Charles H., 4,648,660, Cl. 299-10.000.

Fox, Gary L.: *See*—
Watkins, Bruce J.; Regan, Albert M.; Crager, Bruce L.; Fox, Gary L.; and Houlgrave, Robert C., 4,648,747, Cl. 405-195.000.

Fox, Ronald L.: *See*—
Eisenhawer, Stephen; Mulac, Anthony J.; Donaldson, A. Burl; and Fox, Ronald L., 4,648,835, Cl. 431-4.000.

Fox, Steve A.; Murray, Donald L.; and Dinkin, Frederick, to Cel Co., Inc. Bendable lightweight article for personal grooming and method of making. 4,648,414, Cl. 132-43.00R.

Fox, William D.; and Mereness, William M., to Senmed, Inc. Disposable stapler. 4,648,542, Cl. 227-19.000.

Fradenburgh, Evan A.; Kiely, Edmond F.; and Miller, Gordon G., to United Technologies Corporation. Composite flexbeam for a rotary wing aircraft. 4,648,800, Cl. 416-134.00A.

Fragema: *See*—
Dehon, Claude; and Kolmayer, Andre , 4,649,020, Cl. 376-419.000.

Framatome: *See*—
Holcblat, Alain H.; Sundheimer, Patrick; and Pascal, Yves, 4,648,354, Cl. 122-32.000.
Jacquot, Alain; and Charpentier, Jacques, 4,648,294, Cl. 82-4.00R.

Francioni, Renzo, to Cavanna S.p.A. Conveyor device with two belts for sweet products. 4,648,504, Cl. 198-606.000.

Francotyp GmbH: *See*—
Denzin, Horst, 4,649,489, Cl. 364-464.000.

Frank, Richard. Visual fire alarm apparatus. 4,649,376, Cl. 340-691.000.

Frankl & Kirchner GmbH & Co KG: *See*—
Palloch, Herbert; and Erndt, Hans, 4,648,855, Cl. 474-144.000.

Franz, Peter: *See*—
Bode, Werner; Franz, Peter; and Wilke, Heinrich, 4,649,309, Cl. 310-234.000.

Frearson, William H., to Avdel Limited. Breakstem fastener installation tool. 4,648,258, Cl. 72-391.000.

Freese, Dwight L.; Frey, Emory L.; and Cogbill, Randall B., to Halliburton Company. Multi-function apparatus for testing a sample of material. 4,648,264, Cl. 73-64.100.

French, Lloyd S., administrator: *See*—
Bernstein, David H.; Buckley, Edward M.; March, Roger W.; and Gusowski, Ronald I., deceased, 4,649,470, Cl. 364-200.000.

Frey, Emory L.: *See*—
Freese, Dwight L.; Frey, Emory L.; and Cogbill, Randall B., 4,648,264, Cl. 73-64.100.

Fricker, Urs: *See*—
Martin, Henry; and Fricker, Urs, 4,648,895, Cl. 71-88.000.

Friddle, Frank E. Low profile neck ring orthosis. 4,648,390, Cl. 128-78.000.

Friedlander, Charles B., to PPG Industries, Inc. Radiation curable compositions based on radiation curable esters of polyfunctional hydroxyl-containing carboxylic acids. 4,649,082, Cl. 428-461.000.

Friedman, Clifford H., to Hazeltine Corporation. Double-tuned blade monopole. 4,649,396, Cl. 343-705.000.

Friedrich Deckel Aktiengesellschaft: *See*—
Geiger, Michael; Finsterwalder, Bernd; and Kagerer, Franz, 4,648,172, Cl. 29-568.000.

Friedrich, Heinz-Dieter: *See*—
Reinmold, Heinz-Josef; Mucha, Horst; and Friedrich, Heinz-Dieter, 4,648,210, Cl. 51-165.770.

Frielinghaus, Walter S.: *See*—
Klupfel, Olaf; Frielinghaus, Walter S.; and Scholz, Erhard, 4,648,646, Cl. 294-106.000.

Fries, Christopher: *See*—
Chorley, William; Redding, Robert; and Fries, Christopher, 4,649,533, Cl. 370-58.000.

Fries, Donald W.; and Troscinski, David W., to Eaton Corporation. Thermostat. 4,649,362, Cl. 337-323.000.

Friese, David D., to Dow Chemical Company, The. Removal of ferric chloride from halopyridines. 4,649,201, Cl. 546-345.000.

Frito-Lay Inc.: *See*—
Wisdom, Lawrence W.; and Joseph, Ponnattu K., 4,648,296, Cl. 83-13.000.

Fritz Schafer Gesellschaft mit beschrankter Haftung: *See*—
Schafer, Gerhard, 4,648,517, Cl. 211-183.000.

Froment, Francis: *See*—
Mazzorana, Alfred B.; and Froment, Francis, 4,649,285, Cl. 290-48.000.

Fruechte, Kevin M.; Andrejeski, Gary J.; and Braatz, Robert E., to BOC Group, Inc., The. Bistable two position valve. 4,648,427, Cl. 137-826.000.

Fuji Electric Co., Ltd.: *See*—
Miyoshi, Noriomi; Tsuruoka, Michihiko; and Nagumo, Mutsumi, 4,648,280, Cl. 73-861.240.

Fuji Photo Film Co., Ltd.: *See*—
Fukai, Nobutaka; Ohara, Yuji; and Agano, Toshitaka, 4,648,685, Cl. 350-6.600.
Kiuchi, Seiji, 4,648,562, Cl. 242-56.00A.
Komiyama, Choji; and Oishi, Kengo, 4,648,507, Cl. 206-232.000.
Mukunoki, Yasuo; Yokoyama, Shigeki; Kawasaki, Hiroshi; Nemori, Ryoichi; and Takeuchi, Tetsuo, 4,649,102, Cl. 430-527.000.
Nakamura, Taku; and Hirai, Hiroyuki, 4,649,104, Cl. 430-617.000.
Ogawa, Hiroshi; Saito, Shinji; Mizuno, Chiaki; and Tamai, Yasuo, 4,649,081, Cl. 428-447.000.
Ryoke, Katsumi; Yamaguchi, Nobutaka; Takahashi, Masatoshi; Hanai, Kazuko; Kosha, Hideaki; and Tadokoro, Eiichi, 4,649,072, Cl. 428-212.000.
Takahashi, Osamu; and Sakai, Minoru, 4,649,095, Cl. 430-216.000.
Takeda, Keiji, 4,649,098, Cl. 430-270.000.
Yabuki, Yoshiharu; Sato, Kozo; Kawata, Ken; and Hirai, Hiroyuki, 4,649,103, Cl. 430-570.000.

Fujii, Kazuo: *See*—
Iwata, Kazuyoshi; and Fujii, Kazuo, 4,648,209, Cl. 51-90.000.

Fujii, Takayoshi: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,649,133, Cl. 514-42.000.

Fujii, Takayuki; and Baba, Masayoshi, to Honda Giken Kogyo Kabushiki Kaisha. Body for two-wheeled or three-wheeled vehicle. 4,648,650, Cl. 296-203.000.

Fujikawa, Katsuhiro, to Mitsubishi Denki Kabushiki Kaisha. Speed control apparatus for sewing machine. 4,648,339, Cl. 112-277.000.

Fujiki, Yasuo: *See*—
Watanabe, Kenshu; Shiba, Kiminori; Arai, Mikiya; Yamaguchi, Masaya; Fujiki, Yasuo; and Fujimoto, Ryohei, 4,648,480, Cl. 181-158.000.

Fujimoto, Kazuhisa: *See*—
Ishii, Shinzo; Katsumata, Shigeo; Arai, Yukou; Fujimoto, Kazuhisa; and Morimoto, Makoto, 4,649,199, Cl. 544-342.000.

Fujimoto, Ryohei: *See*—
Watanabe, Kenshu; Shiba, Kiminori; Arai, Mikiya; Yamaguchi, Masaya; Fujiki, Yasuo; and Fujimoto, Ryohei, 4,648,480, Cl. 181-158.000.

Fujimura, Satoshi: *See*—
Yoda, Kiyoshi; Itagaki, Hidenobu; Fujimura, Satoshi; and Yamada, Tadatoshi, 4,649,345, Cl. 324-309.000.

Fujirebio Kabushiki Kaisha: *See*—
Kasahara, Yasushi; Ashihara, Yoshihiro; and Suzuki, Hiromasa, 4,649,105, Cl. 435-5.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Takaya, Takao; Takasugi, Hisashi; and Yamanaka, Hideaki, 4,649,136, Cl. 514-202.000.
Takaya, Takao; Murata, Masayoshi; and Ito, Kiyotaka, 4,649,142, Cl. 514-274.000.
Takaya, Takao; and Takasugi, Hisashi, 4,649,146, Cl. 514-307.000.

Fujishima, Satoru: *See*—
Ogawa, Toshio; Fujishima, Satoru; and Ando, Akira, 4,649,313, Cl. 310-358.000.

Fujita, Akira: *See*—
Shimizu, Kyoichi; and Fujita, Akira, 4,649,438, Cl. 358-337.000.

Fujitsu Limited: *See*—
Nakano, Tomio, 4,649,289, Cl. 307-246.000.
Takemae, Yoshihiro; Nakano, Tomio; and Sato, Kimiaki, 4,649,406, Cl. 357-23.600.
Tsuchida, Manabu; and Yoshida, Masanobu, 4,649,521, Cl. 365-185.000.

Fujiwara, Masatoshi: *See*—
Doki, Yoshikuni; Fujiwara, Masatoshi; Shiga, Tatsuhide; Shono, Yohsuke; Tanaka, Mikio; and Tsuruoka, Yoshihiro, 4,649,359, Cl. 335-222.000.

Fujiyama, Yasutomo, to Canon Kabushiki Kaisha. Plasma CVD apparatus. 4,648,348, Cl. 118-723.000.

Fukai, Nobutaka; Ohara, Yuji; and Agano, Toshitaka, to Fuji Photo Film Co., Ltd. Method of driving galvanometer mirror. 4,648,685, Cl. 350-6.600.

Fukuda, Yasuko: *See*—
Namiki, Mitsuo; Osawa, Toshihiko; Fukuda, Yasuko; and Ozaki, Tatsuhiko, 4,649,206, Cl. 549-435.000.

Fulcher, Carol A.: *See*—
Zimmerman, Theodore S.; and Fulcher, Carol A., 4,649,132, Cl. 514-12.000.

Fuller, William A., to Colt Industries Operating Corp. Electromagnetically actuatable fluid valve. 4,648,559, Cl. 239-585.000.

Funada, Fumiaki: *See*—
Takeda, Makoto; Nonomura, Keisaku; and Funada, Fumiaki, 4,649,383, Cl. 340-805.000.

Fung, Shun C.: *See*—
Poeppelmeier, Kenneth R.; Funk, Walter G.; Steger, John J.; Fung, Shun C.; Cross, Virginia R.; and Kao, Jar-Lin, 4,648,960, Cl. 208-138.000.

Funghini, Augusto; Schwab, Dieter; and Springer, Helmut, to Italimpianti S.p.A. Walking beam furnace. 4,648,837, Cl. 432-122.000.

Funk, Walter G.: *See*—
Poeppelmeier, Kenneth R.; Funk, Walter G.; Steger, John J.; Fung, Shun C.; Cross, Virginia R.; and Kao, Jar-Lin, 4,648,960, Cl. 208-138.000.

Furfaro, Angelo P.: *See*—
Herber, Raymond R.; and Furfaro, Angelo P., 4,648,959, Cl. 208-89.000.

Furomoto, Yoshiyuki, to Shimano Industrial Company Limited. Selectable positive or friction drive for a fishing reel. 4,648,566, Cl. 242-213.000.

Furst, Wilhelm; Rudenauer, Werner; and Siebert, Rainer, to Diehl GmbH & Co. Detonator triggering device. 4,648,320, Cl. 102-210.000.

Furubayashi, Hisatoshi; Tabuchi, Hiroki; and Hijikigawa, Masaya, to Sharp Kabushiki Kaisha. Platinum resistor for the measurement of temperatures. 4,649,365, Cl. 338-25.000.

Fusco, James V.: *See*—
Gardner, Irwin J.; and Fusco, James V., 4,649,178, Cl. 525-306.000.

G. D. Searle & Co.: *See*—
Mueller, Richard A.; and Partis, Richard A., 4,649,147, Cl. 514-315.000.
Partis, Richard A.; and Mueller, Richard A., 4,649,157, Cl. 514-545.000.
G.D Societa per Azioni: *See*—
Mattei, Riccardo, 4,648,409, Cl. 131-60.000.
GA Technologies Inc.: *See*—
Woolf, Lawrence D., 4,648,271, Cl. 73-204.000.
Gaal, Gyorgyi: *See*—
Baviere, Marc; Moulu, Jean-Claude; Paal, Tibor; Tiszai, Gyorgy; Gaal, Gyorgyi; Schmidt, Laszlo; and Gesztesi, Gyula, 4,648,431, Cl. 166-273.000.
Gabbert, James D.; Garner, Albert Y.; and Hedrick, Ross M., to DM Rim Nylon Vof. Process for the preparation of nylon block polymers. 4,649,177, Cl. 525-408.000.
Gabillet, Jean-Francois, to Jeumont-Schneider Corporation. Interface for connecting a computer system to an activator module. 4,649,469, Cl. 364-130.000.
Gaines, Bernard S., to Trine Products Corp. Electrical connection apparatus for lighting fixtures. 4,648,675, Cl. 339-97.00P.
Gallay, Jean-Jacques; and Schweizer, Ernst, to Ciba-Geigy Corporation. Process for the manufacture of novel benzazole derivatives, pharmaceutical preparations containing these derivatives, and their use. 4,649,149, Cl. 514-367.000.
Gamarra, Jose P., to Raychem Corporation. Drop-wire closure having first and second cams. 4,648,680, Cl. 339-105.000.
Gambertoglio, Louis M., to Hughes Tool Company. Firing head for a tubing conveyed perforating gun. 4,648,470, Cl. 175-4.540.
Ganellin, Charon R.: *See*—
Durant, Graham J.; Ganellin, Charon R.; and Vickers, Margaret R., 4,649,138, Cl. 514-232.000.
Gang-Nail Systems Inc.: *See*—
Reaves, Lloyd L.; and Dawick, John K., 4,648,216, Cl. 52-90.000.
Gant, Alan D.: *See*—
Briggs, Willard S.; Gant, Alan D.; Gupta, Parveen K.; and Ferson, Isadore S., 4,649,471, Cl. 364-200.000.
Gaprindashvili, Khanzerifa I.; Kogan, Vadim E.; Kekelia, Dzhemal I.; Pronkin, Alexei A.; Salukvadze, Nana A.; Bakuradze, Georgy V.; and Evstropiev, Konstantin K., deceased (by Evstropieva, Galina I., Sergei K. Evstropiev, administrators), to Institut Kibernetiki Akademii Nauk Gruzinskoi SSR. Glass with anionic conductivity for fluorine. 4,649,126, Cl. 501-43.000.
Gardner, Irwin J.; and Fusco, James V., to Exxon Research & Engineering Co. Process for producing brominated butyl rubber high in primary allylic bromine. 4,649,178, Cl. 525-306.000.
Garg, Desh R.; and Ritscher, James S., to Union Carbide Corporation. Process for removing toxic organic materials from weak aqueous solutions thereof. 4,648,977, Cl. 210-673.000.
Garlick, Russell K.; and Jirousek, Ludek, to Du Pont de Nemours, E. I., and Company. Radiolabeling of methionine-containing proteins and peptides. 4,649,039, Cl. 424-1.100.
Garner, Albert Y.: *See*—
Gabbert, James D.; Garner, Albert Y.; and Hedrick, Ross M., 4,649,177, Cl. 525-408.000.
Garrett Corporation, The: *See*—
Tippetts, Thomas B.; and Cycon, Michael F., Jr., 4,648,807, Cl. 417-322.000.
Gartner, Klaus W. Lock protecting device for high security safes. 4,648,255, Cl. 70-417.000.
Gash, Bruce W.; Arri, Luis E.; Hunt, Elton B., Jr.; and Parrish, David R., to Amoco Corporation. Method of producing synthesis gas by underground gasification of coal using specific well configuration. 4,648,450, Cl. 166-259.000.
Gaske, Joseph E.; and Zychowski, Edwin A., to DeSoto, Inc. Coating compositions and nail polish compositions including the same. 4,649,045, Cl. 424-61.000.
Gass, Karl; Fory, Werner; Meyer, Willy; and Topfl, Werner, to Ciba-Geigy Corporation. N-phenylsulfonyl-N'-triazinylureas. 4,648,899, Cl. 71-93.000.
Gatechair, Leslie R.: *See*—
Kosiorek, Raymond S.; and Gatechair, Leslie R., 4,649,062, Cl. 427-54.100.
Gates Energy Products, Inc.: *See*—
Uba, Toshio; and Nelson, Robert F., 4,648,177, Cl. 29-623.200.
Gaudich, Werner: *See*—
Erdelitsch, Herbert; Gaudich, Werner; and Hecht, Walter, 4,648,728, Cl. 384-537.000.
Gault, Frank W.: *See*—
Haynes, Charles W.; and Gault, Frank W., 4,648,292, Cl. 81-57.160.
Gavin, Joseph A.: *See*—
Schmitt, Ray F.; Gavin, Joseph A.; Kempel, Francis D.; and Waltrick, Charles N., deceased, 4,649,281, Cl. 250-574.000.
Gdula, Michael, to General Electric Company. Dynamic memory controller for single-chip microprocessor. 4,649,511, Cl. 364-900.000.
Gebelius, Sven R. Supporting member. 4,648,220, Cl. 52-155.000.
Gebr. Buhler Nachfolger GmbH: *See*—
Losch, Dieter, 4,648,693, Cl. 350-636.000.
Geering, Emil J., to Occidental Chemical Corporation. Process for preparing methyl chlorosulfates. 4,649,209, Cl. 558-46.000.
Geiger, Michael; Finsterwalder, Bernd; and Kagerer, Franz, to Friedrich Deckel Aktiengesellschaft. Machine tool for having a spindlehead carrier and a spindlehead which is supported swingably thereon. 4,648,172, Cl. 29-568.000.
Geil, James A.: *See*—
Agdanowski, Ronald T.; Geil, James A.; and Tatro, Bernard J., 4,648,398, Cl. 128-207.180.
Geipel, Werner: *See*—
Ullrich, Hansjurgen; and Geipel, Werner, 4,648,972, Cl. 210-541.000.
Geiser, Jens; and Viaud, Jean, to Deere & Company. Baling machine. 4,648,239, Cl. 56-341.000.
Gellekink, Bernard; and Hol, Willem A., to Hollandse Signaalapparaten B.V. Pulse radar apparatus. 4,649,395, Cl. 342-158.000.
Gellert, Jobst U. Composite plate method of manufacturing injection molding manifold. 4,648,546, Cl. 228-161.000.
Genaro, Donald M.: *See*—
Conner, James M.; Harden, Daniel K.; and Genaro, Donald M., 4,648,867, Cl. 604-14.000.
Genbrugge, Hubert: *See*—
Nolf, Jean-Marie E.; Genbrugge, Hubert; Buekers, Valere; Mendes, Luiz N.; Doucet, Jos; and Vansant, Jan, 4,648,168, Cl. 29-447.000.
GenCorp Inc.: *See*—
Brown, Robert L.; and Aylies, Sargeant E., 4,648,935, Cl. 156-577.000.
General Dispensing Systems Limited: *See*—
Young, Michael J. R., 4,648,557, Cl. 239-102.200.
General Dynamics, Pomona Division: *See*—
Dugan, William P., 4,649,338, Cl. 324-158.00P.
Maudal, Inge; and Moss, John F., 4,648,567, Cl. 244-3.240.
Ross, Oakley G.; Kline, Mark L.; and Wedertz, Larry D., 4,648,926, Cl. 156-158.000.
General Electric Company: *See*—
Childress, Jeffrey S., 4,649,567, Cl. 455-17.000.
Ferraro, Angelo, 4,649,321, Cl. 315-224.000.
Gdula, Michael, 4,649,511, Cl. 364-900.000.
Hale, Thomas E.; and Yohe, Warren C., 4,649,084, Cl. 428-552.000.
Heil, Robert F.; and Perry, David S., 4,648,825, Cl. 425-186.000.
Hwang, Tzong Y.; and Campagna, Nicholas F., 4,649,347, Cl. 324-309.000.
Jahns, Thomas M., 4,649,331, Cl. 318-798.000.
Kosky, Philip G.; Silva, James M.; Brunelle, Daniel J.; and Shannon, Thomas G., 4,649,210, Cl. 558-265.000.
Leonard, John A.; and Plumb, Harry A., 4,649,328, Cl. 318-317.000.
Miller, Edward H., 4,648,793, Cl. 415-168.000.
Scott, Graham A., 4,649,455, Cl. 361-93.000.
Stucker, Harold L., 4,649,337, Cl. 324-138.000.
Temple, Victor A. K.; and Tantraporn, Wirojana, 4,648,174, Cl. 29-578.000.
Ulug, Mehmet E., 4,649,535, Cl. 370-86.000.
Zinser, Richard L., Jr.; Silverstein, Seth D.; and Koch, Steven R., 4,649,505, Cl. 379-411.000.
General Motors Corporation: *See*—
Cameron, David S., 4,648,623, Cl. 280-711.000.
General Signal Corporation: *See*—
Trainer, Michael N., 4,648,274, Cl. 73-517.00R.
Gensberger, Karl, to Flutec Fluidtechnische Gerate GmbH. Device for conveyance of a pressure medium, especially oil. 4,648,809, Cl. 417-366.000.
Genzyme Corporation: *See*—
Blair, Henry E., 4,649,108, Cl. 435-22.000.
Geohegan, David B.: *See*—
Eden, James G.; and Geohegan, David B., 4,649,059, Cl. 427-38.000.
George Blair PLC: *See*—
Reynard, Kenneth, 4,648,636, Cl. 292-39.000.
George, Ronald W.; Ohmart, James G.; Irlesberger, Kurt H.; Michaud, Lawrence L.; and Engelhaupt, Darell E., to Martin Marietta Corporation. Apparatus and method for controlling plating induced stress in electroforming and electroplating processes. 4,648,944, Cl. 204-1.00T.
George, William M.: *See*—
Wescoat, Jimmie E.; and George, William M., 4,648,310, Cl. 98-1.000.
Georgiev, Vassil S.; Mullen, George B.; and Swift, Patricia A., to Pennwalt Corporation. 2-(substituted amino)-2-[2-hydroxy-2-alkyl (or phenyl)ethyl]tricyclo[3.3.1.1^{3,7}]decane hydrohalides. 4,649,222, Cl. 564-459.000.
GERB Gesellschaft fur Isolierung mbH & Co., KG: *See*—
Weber, Frank-Michael, 4,648,577, Cl. 248-562.000.
Gerber, Pal: *See*—
Matyas, Bela; Gerber, Pal; Solymos, Andras; Kaszanitzky, Ferenc; Panto, Gyorgy; and Leffler, Janos, 4,649,031, Cl. 423-20.000.
Gerhardinger, Dieter; Wegehaupt, Karl-Heinrich; and Pfeffer, Hans-Rudolf, to Wacker-Chemie GmbH. Anticorrosion coatings for porous concrete metal reinforcing structures. 4,649,066, Cl. 427-387.000.
Gerhardt, Heinz A., to Northrop Corporation. Transverse thrust lift augmentation system. 4,648,571, Cl. 244-207.000.
Gertenbach, Dennis D.: *See*—
Leto, Joseph J.; Gertenbach, Dennis D.; and Gillespie, Daniel W., 4,648,964, Cl. 208-390.000.
Gesztesi, Gyula: *See*—
Baviere, Marc; Moulu, Jean-Claude; Paal, Tibor; Tiszai, Gyorgy; Gaal, Gyorgyi; Schmidt, Laszlo; and Gesztesi, Gyula, 4,648,431, Cl. 166-273.000.
Giachetti, Antonio: *See*—
Bietti, Giuseppe; Cereda, Enzo; Donetti, Arturo; Giachetti, Antonio; and Pagani, Ferdinando, 4,649,150, Cl. 514-392.000.

Gibson, Gary: *See*—
Thomas, Larry D.; Waltke, David L.; and Gibson, Gary, 4,648,521, Cl. 220-1.500.

Gibson, John W.: *See*—
Davis, Robert C.; Gibson, John W.; Skinner, Daniel S., Jr.; Dearth, Timothy E.; and Harris, Dale C., 4,649,042, Cl. 424-438.000.

Gibson-Stephens Neuropharmaceuticals, Inc.: *See*—
Hruby, Victor J., 4,649,191, Cl. 530-329.000.

Giglia, Robert D., to American Cyanamid Company. Reinforced metal substrate. 4,648,902, Cl. 75-229.000.

Gilardini S.p.A.: *See*—
Mariani, Lauro, 4,648,817, Cl. 418-152.000.

Gillbrand, Per; Johansson, Hans; and Nytomt, Jan, to Saab-Scania Aktiebolog. Method and apparatus for detecting ion current in an internal combustion engine ignition system. 4,648,367, Cl. 123-425.000.

Gillespie, Daniel W.: *See*—
Leto, Joseph J.; Gertenbach, Dennis D.; and Gillespie, Daniel W., 4,648,964, Cl. 208-390.000.

Giordano, Joseph F. Lockable sliding gate latching device. 4,648,640, Cl. 292-228.000.

GKN Kwikform Limited: *See*—
Lovering, Dennis W., 4,648,484, Cl. 182-222.000.

Gladfelter, Elizabeth J.; and Rogier, Edgar R., to Henkel Corporation. 5(6)-hydroxymethyl-norbornane-2-carboxylic acid esters and polyurethanes prepared therefrom. 4,649,214, Cl. 560-120.000.

Glasscock, Maynard S.: *See*—
Guy, Arthur L.; and Glasscock, Maynard S., 4,648,752, Cl. 405-217.000.

Gmelin, Karl; Kubach, Hans; Maisch, Wolfgang; Peters, Klaus-Jurgen; and Schelhas, Peter, to Robert Bosch GmbH. Fuel injection system. 4,648,368, Cl. 123-454.000.

Goedhart, Cornelis, to Esmil B.V. Method of cleaning contaminated soil. 4,648,332, Cl. 110-346.000.

Goepfert, Serge P. P.; Renault, Serge A. M.; and Roger, Francoise M. M., to Corning Glass Works. Method of making transparent polarizing laminated glasses. 4,648,925, Cl. 156-153.000.

Goff, Charles W.; and Goff, Charles W., Jr. Receiver and barrel coupling. 4,648,191, Cl. 42-75.020.

Goff, Charles W., Jr.: *See*—
Goff, Charles W.; and Goff, Charles W., Jr., 4,648,191, Cl. 42-75.020.

Gohara, Wadie F., to Babcock & Wilcox Company, The. Fluidized sand expansion joint. 4,648,353, Cl. 122-4.00D.

Gold Star Co., Ltd.: *See*—
Park, Chan W., 4,649,429, Cl. 358-192.100.

Goldberg, Edward M.; and Bazell, Seymour. Device for evacuating body fluids. 4,648,870, Cl. 604-135.000.

Goldenberg, Louis. Photo-electric object detector having removable field stop means. 4,649,270, Cl. 250-221.000.

Gomi, Tatsuya: *See*—
Tanaka, Hideo; Ohhashi, Kuniyoshi; Gomi, Tatsuya; and Dobashi, Tomoyuki. 4,649,054, Cl. 426-397.000.

Gomi, Tetsuo; Suganuma, Nobuo; Ishii, Kazuo; and Sato, Hiroshi, to Lion Corporation. Oral composition. 4,649,044, Cl. 424-49.000.

Gono, Takeshi: *See*—
Osanai, Akinori; Niwa, Takao; and Gono, Takeshi, 4,649,485, Cl. 364-424.100.
Osanai, Akinori; Gono, Takeshi; and Niwa, Takao, 4,649,487, Cl. 364-424.100.
Osanai, Akinori; Gono, Takeshi; and Niwa, Takao, 4,649,488, Cl. 364-424.100.

Goodlaxson, John D., to Goodlaxson Mfg. Inc. Heating kettle. 4,649,263, Cl. 219-438.000.

Goodlaxson Mfg. Inc.: *See*—
Goodlaxson, John D., 4,649,263, Cl. 219-438.000.

Goodman, Jerome, to United States of America, Navy. Underwater acoustic impedance measuring apparatus. 4,648,275, Cl. 73-589.000.

Gorling, Karl: *See*—
Bostrom, Olle; and Gorling, Karl, 4,648,900, Cl. 75-3.000.

Gosudarstvenny Proektno-Konstruktorsky I Experimentalny Institut Ugolnogo Mashinostroenia "Giprouglemash" : *See*—
Masovich, Felix Z.; and Starichnev, Vladimir V., 4,648,659, Cl. 299-1.000.

Goto, Hirokazu: *See*—
Sawada, Takeshi; Toda, Yasushi; and Goto, Hirokazu, 4,649,449, Cl. 360-123.000.

Goto, Hiroshi: *See*—
Sugiyama, Sadao; and Goto, Hiroshi, 4,648,723, Cl. 384-9.000.
Sugiyama, Sadao; and Goto, Hiroshi, 4,648,724, Cl. 384-9.000.

Goto, Masahiro, to Canon Kabushiki Kaisha. Toner density detector and toner supplier. 4,648,702, Cl. 355-3.0DD.

Gould, John M., to United States of America, Agriculture. Alkaline peroxide treatment of nonwoody lignocellulosics. 4,649,113, Cl. 435-165.000.

Grady, John K.; Rice, Paul G.; and Van Steenburg, Kip P., to Grady, John K. Digital X-ray stand. 4,649,560, Cl. 378-196.000.

Graf, Gregor; Holzle, Gerd; and Reinert, Gerhard, to Ciba-Geigy Corporation. Water-soluble phthalocyanine compounds. 4,648,992, Cl. 540-124.000.

Granger, Maurice. Automatic dispenser of pre-cut and Z-wrapped or folded web materials. 4,648,530, Cl. 221-34.000.

Grangroth, Robert H.; and Loy, Jerald M., to Honeywell Inc. Integrated circuit interface. 4,649,339, Cl. 324-158.00F.

Granlund, Ingvar, to Axhamre International AB. Rotary stand. 4,648,574, Cl. 248-349.000.

Grant, Barbara Ann: *See*—
Grant, Willson B. D., 4,648,501, Cl. 198-397.000.

Grant, Willson B. D., to Grant, Barbara Ann; and Grant, Willson Barratt David. Apparatus for sorting and aligning handles for cardboard boxes or the like and for supplying such to an insertion apparatus. 4,648,501, Cl. 198-397.000.

Grant, Willson Barratt David: *See*—
Grant, Willson B. D., 4,648,501, Cl. 198-397.000.

Gras, Rainer, to Chemische Werke Huls Aktiengesellschaft. One-component baking enamels. 4,649,067, Cl. 427-388.200.

Grau Girling Limited: *See*—
Beaumont, Paul, 4,648,805, Cl. 417-223.000.

Gray, Reed A.; and Hyazk, Daniel L., to Stauffer Chemical Co. Herbicide compositions of extended soil life. 4,648,894, Cl. 71-87.000.

Graziani, Kenneth R.; and Kyan, Chwan P., to Mobil Oil Corporation. Lube hydrodewaxing method and apparatus with light product removal and enhanced lube yields. 4,648,957, Cl. 208-58.000.

Graziano, Lewis R., to American Bank Note Company. Apparatus for applying stamps to packages arrayed in cartons. 4,648,933, Cl. 156-361.000.

Greeb, Rolf: *See*—
Kunze, Lothar; Greeb, Rolf; and Bender, Ralf, 4,648,420, Cl. 137-312.000.

Green, Russell D. Mixing and discharge capsule. 4,648,532, Cl. 222-82.000.

Greenbacker, Dale E., to Daleco, Inc. Device for steam cooking food. 4,648,382, Cl. 126-348.000.

Greene, William G. Wheel lifting kit for bumper jacks. 4,648,583, Cl. 254-133.00R.

Greeson, Logan C. Self-lifting gantry crane and boom therefor. 4,648,518, Cl. 212-199.000.

Gregorutti, Paolo: *See*—
Melzi, Carlo; and Gregorutti, Paolo, 4,648,434, Cl. 152-213.00A.

Gregory, David P.: *See*—
Postle, Stephen R.; Elton, Peter J.; and Gregory, David P., 4,649,026, Cl. 422-56.000.

Greider, C. Austin; Stephenson, David G.; Lee, Terry R.; and Durfee, John R., to Western International, Inc. Removable grass catcher. 4,648,238, Cl. 56-202.000.

Gretag Aktiengesellschaft: *See*—
Keller, Guido; Spiess, Andreas; Ott, Hans; and Boegli, Rolf, 4,649,502, Cl. 364-519.000.

Grewall, Harpal. Retractable door stop. 4,648,152, Cl. 16-82.000.

Griesinger, Robert E., to Williams & Lane Energy Systems Corporation. Apparatus for providing a constant fuel consumption rate for a fuel powered turbine. 4,648,242, Cl. 60-39.030.

Griffith, Monty: *See*—
Vandervoort, David; and Griffith, Monty, 4,648,822, Cl. 425-135.000.

Grimmer, Eberhard: *See*—
Neuer, Andreas; Grimmer, Eberhard; and Muller, Hartwig, 4,648,249, Cl. 66-75.200.

Grisgraber, Edwin G.: *See*—
Manduley, Flavio; and Grisgraber, Edwin G., 4,649,490, Cl. 364-466.000.

Gritti, Serjio, to BP Chemicals Limited. Stabilizers for silicates in antifreeze compositions. 4,648,982, Cl. 252-75.000.

Grolet, Pierre: *See*—
Dedole, Pascal; Grolet, Pierre; and Laurent, Jean, 4,648,478, Cl. 181-106.000.

Grosjean, Yves H., to TOTAL Compagnie Francaise des Petroles. Method of defining homogeneous rock formation zones along a borehole on the basis of logs. 4,648,268, Cl. 73-152.000.

Grundahl, Bryce K.: *See*—
Grundahl, John C.; and Grundahl, Bryce K., 4,648,582, Cl. 254-133.00R.

Grundahl, John C.; and Grundahl, Bryce K. Portable clamping device for a wheel jack. 4,648,582, Cl. 254-133.00R.

Grundei, Hans, to S + G Implants GmbH. Implant replacement for a extracted tooth. 4,648,842, Cl. 433-175.000.

Gruninger, Edgar, to FFA Flug-und Fahrzeugwerke AG. Sealing process. 4,648,911, Cl. 148-6.270.

GTE Products Corporation: *See*—
Hough, Harold L.; and Bonazoli, Robert P., 4,649,320, Cl. 315-100.000.
Lima, Joseph V.; and Shea, Richard J., 4,648,850, Cl. 445-22.000.
Maya, Jakob, 4,648,951, Cl. 204-157.210.

GTE Valeron Corporation: *See*—
Stashko, Daniel R., 4,648,755, Cl. 407-36.000.

Guerin, Thomas R.; and Lester, Theodore V., to Motorola, Inc. Scanning CRT control system. 4,649,325, Cl. 315-383.000.

Guerra, John M.; and Plummer, William T., to Polaroid Corporation. Method and apparatus for adjusting CRT geometry. 4,649,324, Cl. 315-370.000.

Guilbault, Lawrence J.; McEntee, Thomas C.; Koob, Judith L.; and Brophy, James F., to Morton Thiokol Inc. Method of incorporating antimicrobial agents into fibers. 4,649,079, Cl. 428-375.000.

Guilbault, Lawrence J.: *See*—
McEntee, Thomas C.; Guilbault, Lawrence J.; Brophy, James F.; and Koob, Judith L., 4,649,078, Cl. 428-375.000.

Guilhem, Jacques R. J.: *See*—
Cartier, Claude J.; Guilhem, Jean R. R.; Guilhem, Jacques R. J.; and Wenger, Roger L. L., 4,648,392, Cl. 128-160.000.

Guilhem, Jean R. R.: *See*—
Cartier, Claude J.; Guilhem, Jean R. R.; Guilhem, Jacques R. J.; and Wenger, Roger L. L., 4,648,392, Cl. 128-160.000.

Gumbmann, Joseph, Jr. Irrigation device. 4,648,555, Cl. 239-63.000.
Gupta, Parveen K.: *See*—
Briggs, Willard S.; Gant, Alan D.; Gupta, Parveen K.; and Ferson, Isadore S., 4,649,471, Cl. 364-200.000.
Gusowski, Ronald I., deceased: *See*—
Bernstein, David H.; Buckley, Edward M.; March, Roger W.; and Gusowski, Ronald I., deceased, 4,649,470, Cl. 364-200.000.
Gutekunst, Stanley K.; Scheel, Russell H.; and Ziegenfus, Barry L., to Heico Inc. Linear drive unit. 4,648,325, Cl. 104-166.000.
Gutridge, John R.: *See*—
Morritt, Graham N.; Paes, Malvolio L.; Conacher, Ian D.; Gutridge, John R.; and Snellgrove, Timothy R., 4,648,386, Cl. 128-4.000.
Guy, Arthur L.; and Glasscock, Maynard S., to Exxon Production Research Co. Marine template retaining wall and method of construction. 4,648,752, Cl. 405-217.000.
Guyot, Marcel: *See*—
Cagan, Vladimir; and Guyot, Marcel, 4,649,495, Cl. 364-481.000.
Gyllang, Hans E.; Ekblom, Bjorn T.; Wesshagen, Vera V.; and Ericson, Kjell Y., to AB Pripps Bryggerier. Beverage product. 4,649,051, Cl. 424-154.000.
H. A. Schlatter AG: *See*—
Zollinger, Hans R., 4,649,253, Cl. 219-101.000.
H. Krantz, GmbH & Co.: *See*—
Kehlenbach, Gunther, 4,648,251, Cl. 68-15.000.
H. Wohlenberg KG GmbH & Co.: *See*—
Hartlage, Jurgen, 4,648,772, Cl. 414-115.000.
Haas, Roger A.; and Henesian, Mark A., to United States of America, Energy. Electro-optic harmonic conversion to switch a laser beam out of a cavity. 4,649,544, Cl. 372-22.000.
Hackett, Kenneth R.: *See*—
Aires, Ramon H.; Clark, Charles A., Jr.; Ito, Roy A.; and Hackett, Kenneth R., 4,649,385, Cl. 379-57.000.
Haferkamp, Gilbert L.: *See*—
Carlin, Joseph T.; and Haferkamp, Gilbert L., 4,648,452, Cl. 166-274.000.
Haga, Hiroya: *See*—
Minamida, Katsuhiro; Takafuji, Hideo; Haga, Hiroya; and Mizuhashi, Nobuo, 4,649,256, Cl. 219-121.0LD.
Haggqvist, Alf, to AB Varnamo Gummifabrik. Device for fastening an additional pane in a window. 4,648,221, Cl. 52-202.000.
Hagner, Robert C., to Bas-Tex Corporation. High pressure flow line connection. 4,648,632, Cl. 285-334.100.
Hahn, Othmar: *See*—
Muller, Rolf; Niederer, Hans; and Hahn, Othmar, 4,648,994, Cl. 260-380.000.
Hakuba Shashin Sagyo Kabushiki Kaisha: *See*—
Iwasaki, Osamu, 4,648,698, Cl. 354-293.000.
Hale, Thomas E.; and Yohe, Warren C., to General Electric Company. Process for adhering an oxide coating on a cobalt-enriched zone, and articles made from said process. 4,649,084, Cl. 428-552.000.
Hales, Bernard C., to Lucas Industries public limited company. Heating device. 4,648,361, Cl. 123-179.00H.
Hall, Dennis G.: *See*—
Holland, William R.; and Hall, Dennis G., 4,649,280, Cl. 250-483.100.
Hall, Randall C., to O. I. Corporation. Electrolytic conductivity detection process. 4,649,124, Cl. 436-150.000.
Hall, Sture; and Persson, Bertil. Apparatus for preparing the edges of metal sheets to be welded. 4,648,762, Cl. 409-138.000.
Hallberg, Hakan; Osterberg, Hans; and Olander, Einar. Band magazine with anchor band. 4,648,343, Cl. 114-210.000.
Halliburton Company: *See*—
Busch, Randolph A., 4,648,444, Cl. 166-65.100.
Caskey, Kenneth D., 4,648,445, Cl. 166-98.000.
Fore, William M.; and Caskey, Kenneth D., 4,648,446, Cl. 166-123.000.
Freese, Dwight L.; Frey, Emory L.; and Cogbill, Randall B., 4,648,264, Cl. 73-61.100.
Hallsworth, Rodney S.; and Wirsig, Ralph C., to Du Pont Canada Inc. Continuous high speed spin-draw-texturing process for nylon yarn. 4,648,240, Cl. 57-288.000.
Halpern, Peter H.; Mallory, Peter E.; Haug, Paul E.; and Koos, William M., Jr., to Sophisticated Signals and Circuits. Apparatus for synchronizing linear PN sequences. 4,649,549, Cl. 380-32.000.
Hama, Masaaki: *See*—
Hashimoto, Tadanori; Hama, Masaaki; and Kobayashi, Osamu, 4,649,003, Cl. 264-63.000.
Hamada, Nagaharu: *See*—
Kojima, Yasuyuki; Hamada, Nagaharu; and Hori, Yasuro, 4,649,401, Cl. 346-76.0PH.
Hambric, James C. Locknut assembly for high-speed rotary components. 4,648,768, Cl. 411-217.000.
Hammer, William E.; Schwane, Walter H.; and Ziecina, Frederick J., to International Business Machines Corporation. Flexible data transmission for message based protocols. 4,649,473, Cl. 364-200.000.
Hamon, Jean-Pierre: *See*—
Puisais, Xavier F.; Hamon, Jean-Pierre; Jegousse, Michel; and Kaluszynski, Michel, 4,648,544, Cl. 228-44.500.
Hampton, Leonard; and Hohulin, Samuel E., to National Union Electric Corp. Vacuum cleaner assembly. 4,648,149, Cl. 15-360.000.
Hanai, Kazuko: *See*—
Ryoke, Katsumi; Yamaguchi, Nobutaka; Takahashi, Masatoshi; Hanai, Kazuko; Kosha, Hideaki; and Tadokoro, Eiichi, 4,649,072, Cl. 428-212.000.
Hanamoto, Mark S.: *See*—
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Hancock, William R.: *See*—
Johnson, Michael J.; and Hancock, William R., 4,649,378, Cl. 340-728.000.
Hand, John J.: *See*—
Addor, Roger W.; Wright, Donald P., Jr.; Siddens, Jack K.; and Hand, John J., 4,649,148, Cl. 514-321.000.
Hand Widmaier Fabrik fur Apparate der Fernmelde -und Feinwerktechnik: *See*—
Schmid, Theobald; Widmaier, Horst; and Wolf, Friedrich, 4,649,246, Cl. 200-159.00B.
Hanisch, Horst: *See*—
Suerken, Hans P.; Amort, Jurgen; Hanisch, Horst; and van der Maas, Hendrikus, 4,649,220, Cl. 564-296.000.
Hankins, Dale E., to United States of America, Energy. CR-39 track etching and blow-up method. 4,648,950, Cl. 204-129.400.
Hannappel, Gerald J. Convertible load carrying apparatus for all terrain vehicles. 4,648,617, Cl. 280-289.00A.
Hansson, Volker: *See*—
Waltersdorf, Klaus P.; and Hansson, Volker, 4,649,018, Cl. 376-272.000.
Hanyu, Susumu; Kata, Kenji; and Takahashi, Yoshitaka, to Janome Sewing Machine Co., Ltd. Automatic buttonhole stitching device of a computerized sewing machine. 4,648,340, Cl. 112-447.000.
Harara, Mitsuhiko: *See*—
Wada, Shunichi; Shimomura, Setsuhiro; Kumagai, Naotake; Takizawa, Shozo; Maruyama, Mitsunori; Tatemoto, Minoru; Takada, Hiroyuki; and Harara, Mitsuhiko, 4,648,622, Cl. 280-707.000.
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Harden, Daniel K.: *See*—
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Hardin, Roy T., Jr., to Westinghouse Electric Corp. Remotely operable fuel transfer system for nuclear reactor. 4,649,016, Cl. 376-261.000.
Hardwick, Martha K.; Pike, Kelly A.; Evans, George D., II; Edwards, Ronald; and Norman, Jacob J., to American Hospital Supply Corporation. Apparatus for controlling flow and pressure measurement. 4,648,868, Cl. 604-32.000.
Harinishi, Atsushi. Gymnastic floor structure having vertical elasticity. 4,648,592, Cl. 272-3.000.
Harman, Douglas G.: *See*—
Sinha, Susanta; Brown, Philip S.; Harman, Douglas G.; Keller, Harold T.; Olechovsky, David F.; and Cheng, Wenche W., 4,649,492, Cl. 364-472.000.
Harms, John R.; and Anderson, Ronald L., to J. I. Case Company. Truck mounted backhoe. 4,648,780, Cl. 414-686.000.
Harness, John, to Hilton Gun Company Limited. Firearm for firing ammunition of different caliber. 4,648,192, Cl. 42-77.000.
Harp, Terance D.: *See*—
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Harris, Dale C.: *See*—
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Harris, Flora J.: *See*—
Birchak, Robert J.; Harris, Flora J.; and Holt, Amos E., 4,649,343, Cl. 324-220.000.
Harrison, William M. Method of oil recovery. 4,648,449, Cl. 166-249.000.
Harsch, Erich; and Reichenbach, Reiner, to Maschinenfabrik Muller-Weingarten AG. Releasable coupler, particularly for gripper rails in a transfer press. 4,648,736, Cl. 403-297.000.
Hartlage, Jurgen, to H. Wohlenberg KG GmbH & Co. Three-knife cutting machine workfeed. 4,648,772, Cl. 414-115.000.
Hartmann, Rudolf, to United States of America, Army. Temperature stable boresight module. 4,649,274, Cl. 250-341.000.
Hartsing, Tyler F., Jr.; and Sauers, Marvin E. Serving tray article comprising a blend of a sulfone, styrene and a polycarbonate. 4,649,176, Cl. 525-67.000.
Haruna, Masamitsu: *See*—
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Hashimoto, Osamu: *See*—
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Hashimoto, Tadanori; Hama, Masaaki; and Kobayashi, Osamu, to Sumitomo Chemical Company, Limited. Method for producing an inorganic sintered body. 4,649,003, Cl. 264-63.000.
Hashish, Mohamed A.; Kirby, Michael J.; and Pao, Yih-Ho, to Flow Industries, Inc. Method and apparatus for forming a high velocity liquid abrasive jet. 4,648,215, Cl. 51-439.000.
Hasler AG Bern: *See*—
Marbet, Hans, 4,649,231, Cl. 178-2.00B.
Hassenfelt, Harold E., Jr. Biscuit cutting apparatus. 4,648,300, Cl. 83-762.000.
Hatori, Kunitake: *See*—
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Hawkes, Peter C., to Andrews Maclaren Limited. Collapsible support with armrests. 4,648,651, Cl. 297-45.000.
Haworth, Inc.: *See—*
Chatterson, Louis M., 4,648,527, Cl. 220-22.400.
Hayase, Yoshio; Morita, Koichi; Ide, Kinya; and Takahashi, Toshio, to Shionogi & Co., Ltd. Triazine derivatives and herbicides. 4,648,898, Cl. 71-93.000.
Hayashi, Akio: *See—*
Kotani, Kunio; Hayashi, Akio; and Taniguchi, Seiho, 4,648,986, Cl. 252-511.000.
Hayashi, Kenji: *See—*
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Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Evaporative cooling system of internal combustion engine. 4,648,356, Cl. 123-41.210.
Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Cooling system for automotive engine or the like. 4,648,357, Cl. 123-41.270.
Hayes, Gary B.: *See—*
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Hayford, Robert L., Jr. Video game control console. 4,648,603, Cl. 273-148.00B.
Haynes, Charles W.; and Gault, Frank W., to Joy Manufacturing Company. Tong assembly. 4,648,292, Cl. 81-57.160.
Hays, Byron G.; and Stanaback, Robert J., to BASF Corporation. High color strength diarylide yellow pigment compositions. 4,648,907, Cl. 106-30.000.
Hazato, Atsuo: *See—*
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Hazelett, Robert W.; Petry, Charles J.; and Platek, Stanley W., to Hazelett Strip-Casting Corporation. Method and apparatus for feeding and continuously casting molten metal with inert gas applied to the moving mold surfaces and to the entering metal. 4,648,438, Cl. 164-475.000.
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Hazelett, Robert W.; Petry, Charles J.; and Platek, Stanley W., 4,648,438, Cl. 164-475.000.
Hazeltine Corporation: *See—*
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Health Research, Inc.: *See—*
Dougherty, Thomas J.; Potter, William R.; and Weishaupt, Kenneth R., 4,649,151, Cl. 514-410.000.
Heaton, Richard D.; and Linton, Steven C., to Monarch Marking Systems, Inc. Theft deterrent tag. 4,649,397, Cl. 343-895.000.
Hebenstreit GmbH: *See—*
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Hebert, David F., to National Semiconductor Corporation. Semiconductor package with tape mounted die. 4,649,415, Cl. 357-74.000.
Hecht, Walter: *See—*
Erdelitsch, Herbert; Gaudich, Werner; and Hecht, Walter, 4,648,728, Cl. 384-537.000.
Hedrick, Ross M.: *See—*
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Heffner, Robert E.: *See—*
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Hefner, Robert E., Jr.; and White, Mary N., to Dow Chemical Company, The. Imide functional polyphenols; thermosettable compositions containing same and cured products therefrom. 4,649,187, Cl. 528-117.000.
Hefner, Robert E., Jr.; and White, Mary N., to Dow Chemical Company, The. Poly(sulfide carbonate) composition and method for their preparation. 4,649,190, Cl. 528-370.000.
Hegedus, Denes A.: *See—*
Carlson, Lee R.; Hegedus, Denes A.; Jarrett, Steven M.; Miller, Michael F.; Riley, Martin E.; and Wright, David L., 4,649,547, Cl. 372-61.000.
Heggenstaller, Anton. Process for compression molding of sections with a constant cross-section consisting of vegetable particles. 4,649,006, Cl. 264-120.000.
Hegyi, James A. Light emitting roller skate wheels. 4,648,610, Cl. 280-11.190.
Heico Inc.: *See—*
Gutekunst, Stanley K.; Scheel, Russell H.; and Ziegenfus, Barry L., 4,648,325, Cl. 104-166.000.
Heil, Robert F.; and Perry, David S., to General Electric Company. Plastic molding apparatus. 4,648,825, Cl. 425-186.000.
Heimann, Jochen R.: *See—*
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Heimer, Edgar P.: *See—*
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Hein, Richard W.; and Kelso, William C., to Mooney Chemicals, Inc. Process for preserving wood. 4,649,065, Cl. 427-370.000.
Heinz, Gerhard: *See—*
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Heitmann, Uwe, to Hauni-Werke Korber & Co. KG. Apparatus for perforating wrapping material for rod-shaped articles of the tobacco processing industry. 4,648,412, Cl. 131-281.000.
Heitz, Steven A.; and Dobbs, Daniel R., to Sundstrand Corporation. Propulsion and directional control mechanism for an underwater device. 4,648,322, Cl. 102-411.000.
Hemmes, Paul: *See—*
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Henderson, Scott R. Fold-up insulated beverage container holder with a stabilizing support base. 4,648,525, Cl. 220-85.00H.
Henesian, Mark A.: *See—*
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Henkel Corporation: *See—*
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Osberghaus, Rainer; and Kresse, Franz, 4,648,882, Cl. 8-142.000.
Henken, Fritz, to Ford Motor Company. Clutch-pressure control valve. 4,648,423, Cl. 137-494.000.
Hennessy, James J., to Hennessy Products, Inc. Safety design newspaper insert cart. 4,648,613, Cl. 280-79.10A.
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Henslee, Walter W.; Morrow, Stanley J.; and Lindsey, John S., to Dow Chemical Company, The. Magnesium aluminum spinel in light metal reduction cells. 4,648,954, Cl. 204-243.00R.
Herber, Raymond R.; and Furfaro, Angelo P., to UOP Inc. Hydrogenation method for adsorptive separation process feedstreams. 4,648,959, Cl. 208-89.000.
Herbulot, Jean; and Escaillas, Gerard, to Valeo. Motor-operated clutch. 4,648,498, Cl. 192-94.000.
Hermann Wangner GmbH & Co., KG: *See—*
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Hermansson, Hans, to Celleco AB. Rotary disc filter with peripheral cake supports. 4,648,970, Cl. 210-327.000.
Hero Automation: *See—*
Sutton, David W., 4,648,298, Cl. 83-62.000.
Herrmann, Eggert, to Weld-Equip b.v. Device for soldering an element to a print plate. 4,648,543, Cl. 228-6.200.
Herrmann, Wolfgang; and Satzinger, Gerhard, to Warner-Lambert Company. Process for the manufacture of racemic (R,R; S,S) asocainol. 4,649,196, Cl. 540-479.000.
Hertell, Siegfried: *See—*
Schippers, Heinz; and Hertell, Siegfried, 4,648,810, Cl. 417-383.000.
Herve, Jean-Luc; Jouanneau, Jean-Francois; Kristensen, Ivar G.; and Haugen, Finn, to Total Compagnie Francaise des Petroles; and Den Norske Stats Oljeselskap A/S. Assembly of pipes. 4,648,419, Cl. 137-245.500.
Herzog, Hans K.; and Sakurai, Seiya, to Boeing Company, The. Avionic control system. 4,649,484, Cl. 364-424.000.
Hescher, Manfred; and Rosignol, Heinrich, to Robert Bosch GmbH. Method of precise manufacturing of a tape-scanning device for oblique track magnetic recording-reproducing apparatus. 4,649,443, Cl. 360-84.000.
Hess, Peter: *See—*
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Hiramatsu, Tooru; Tami, Kazuya; and Osawa, Kozo, to Tokyo Juki Industrial Co., Ltd. Apparatus for setting a workpiece correctly on a sewing machine. 4,648,335, Cl. 112-114.000.
Hiramoto, Shigeru: *See—*
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Hirao, Toshiki, to Mitsubishi Denki Kabushiki Kaisha. Rotor for a superconducting rotating electric machine. 4,649,303, Cl. 310-52.000.
Hiromori, Kunio; and Noguchi, Masahiko, to NEC Corporation. Flat article feeding apparatus. 4,648,587, Cl. 271-12.000.
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Nishimura, Keizo; Kobayashi, Masaharu; Okamoto, Hiroo; Noguchi, Takaharu; Arai, Takao; and Shibuya, Toshifumi, 4,649,542, Cl. 371-39.000.
Ohki, Masaru; Hirosawa, Toshio; Kurihara, Junichi; and Miyazaki, Katsuto, 4,649,480, Cl. 364-300.000.
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Uetake, Naohito; Kawamura, Fumio; Yusa, Hideo; Kikuchi, Makoto; and Tamata, Shin, 4,648,990, Cl. 252-628.000.
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Borer, Claude; and Schildknecht, Kurt, 4,648,713, Cl. 356-246.000.
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Egli, Werner H., 4,648,716, Cl. 356-350.000.
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Starr, James B., 4,649,363, Cl. 338-4.000.
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Crain, Steven L.; and Miller, Homer W., 4,649,539, Cl. 371-25.000.
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Horowitz, Paul; and van der Hoorn, Rudolf J. G. A., to U.S. Philips Corporation. Apparatus for centering, aligning and clamping an optical disc. 4,649,531, Cl. 369-270.000.
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Horton, Edward E. Jacket tower structure and method of installation. 4,648,750, Cl. 405-208.000.
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Rowland, Robert O., 4,648,888, Cl. 55-21.000.
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Lau, Kreisler S. Y.; and Kelleghan, William J., 4,649,207, Cl. 549-563.000.
Terbrack, William H.; Brion, Harvey F.; and Minear, Ronald J., 4,649,570, Cl. 455-344.000.
Tsuda, George I.; and Edelsohn, Charles R., 4,649,391, Cl. 342-153.000.
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Hultholm, Stig-Erik; Lilja, Launo L.; Makitalo, Valto J.; and Nyman, Bror G., to Outokumpu Oy. Way to oxidize sludge with high solid matter content. 4,648,973, Cl. 210-629.000.
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Williams, Michael R., 4,648,815, Cl. 418-84.000.
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Hyodo, Youichi, to Toyota Jidosha Kabushiki Kaisha. Steering system in wheeled vehicle. 4,648,614, Cl. 280-91.000.
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Ibata, Akihiko; and Sakamoto, Yoichi, to Matsushita Electric Industrial Company, Ltd. Permanent Mn-Al-C alloy magnets. 4,648,915, Cl. 148-101.000.
Ichihara, Akira, to Alps Electric Co., Ltd. Disk support device having deformation limiting member. 4,649,444, Cl. 360-99.000.
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Imhoff, Lee A., to American Institutional Maintenance Corporation. Cell lock. 4,648,253, Cl. 70-135.000.

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Wardle, Ian; and Brattan, Keith, 4,648,953, Cl. 204-237.000.

INA Walzlager Schaeffler KG: *See*—
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Hradil, John H.; Bottomley, Frank; and Crawshay, Richard, 4,648,776, Cl. 414-565.000.

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Inoue, Kiyoshi, 4,649,255, Cl. 219-69.00M.

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Gaprindashvili, Khanzerifa I.; Kogan, Vadim E.; Kekelia, Dzhemal I.; Pronkin, Alexei A.; Salukvadze, Nana A.; Bakuradze, Georgy V.; and Evstropiev, Konstantin K., deceased, 4,649,126, Cl. 501-43.000.

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Bass, Walter E.; Matyas, Stephen M.; and Oseas, Jonathan, 4,649,233, Cl. 380-21.000.
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Bland, Patrick M.; and Bolt, William H., 4,649,373, Cl. 340-365.00R.
Bloom, Robert D.; Carrington, James E.; Ide, Richard A.; Traglia, Patrick J.; and Westcott, Gerald R., 4,649,501, Cl. 364-519.000.
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Malaviya, Shashi D., 4,648,173, Cl. 29-576.00W.
Martin, David H.; and Spanner, Raymond A., 4,649,382, Cl. 340-785.000.
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Ikenoue, Yutaka; Endoh, Hiroyuki; Ishii, Kei; and Suzuki, Keitaro, 4,648,903, Cl. 75-230.000.

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Kuwano, Hiroaki; Matsushita, Toshiro; Kakuma, Hideaki; and Motomiya, Teruaki, 4,648,580, Cl. 251-129.010.

Ismail, Ibrahim A.; Hemmes, Paul; Skarstedt, Mark T.; and Zipp, Adam, to Miles Laboratories, Inc. Viability test device. 4,649,121, Cl. 436-14.000.

Istituto de Angeli, S.p.A.: *See*—
Bietti, Giuseppe; Cereda, Enzo; Donetti, Arturo; Giachetti, Antonio; and Pagani, Ferdinando, 4,649,150, Cl. 514-392.000.

Itagaki, Hidenobu: *See*—
Yoda, Kiyoshi; Itagaki, Hidenobu; Fujimura, Satoshi; and Yamada, Tadatoshi, 4,649,345, Cl. 324-309.000.

Italimpianti S.p.A.: *See*—
Funghini, Augusto; Schwab, Dieter; and Springer, Helmut, 4,648,837, Cl. 432-122.000.

Ito, Kiyotaka: *See*—
Takaya, Takao; Murata, Masayoshi; and Ito, Kiyotaka, 4,649,142, Cl. 514-274.000.

Ito, Roy A.: *See*—
Aires, Ramon H.; Clark, Charles A., Jr.; Ito, Roy A.; and Hackett, Kenneth R., 4,649,385, Cl. 379-57.000.

Ito, Toshifumi, to Honda Giken Kogyo Kabushiki Kaisha. Internal combustion engine for motorcycle. 4,648,359, Cl. 123-90.310.

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ITW Fastex Italia S.p.A.: *See*—
Oddenino, Manrico, 4,648,735, Cl. 403-187.000.

Itzov, Andrew L., to Milwaukee Electric Tool Corporation. Two position linkage. 4,648,758, Cl. 408-136.000.

IVAC Corporation: *See*—
Maget, Henri J. R., 4,648,955, Cl. 204-258.000.
Iwai, Hiroji; and Yamaji, Koji, to Sharp Kabushiki Kaisha. Error correction member positioning system for a printer. 4,648,731, Cl. 400-240.100.
Iwano, Shoji: *See*—
Nakamura, Hisao; and Iwano, Shoji, 4,649,001, Cl. 264-50.000.
Iwasaki, Osamu, to Hakuba Shashin Sagyo Kabushiki Kaisha. Tripod for camera. 4,648,698, Cl. 354-293.000.
Iwasaki, Yasumasa: *See*—
Shibasaki, Sohei; Iwasaki, Yasumasa; Ono, Noriki; Arai, Koichi; Maruyama, Koji; and Shimanari, Tatsumi, 4,648,706, Cl. 355-43.000.
Iwasawa, Susumu, to Sony Corporation. Cassette tape player having sealing means. 4,649,453, Cl. 360-137.000.
Iwase, Taira; Ariizumi, Shoji; and Masuoka, Fujio, to Kabushiki Kaisha Toshiba. Read only semiconductor memory device with polysilicon drain extensions. 4,649,412, Cl. 357-41.000.
Iwata, Kazuyoshi; and Fujii, Kazuo, to Toyo Machinery Co., Ltd. Small-sized drill grinding machine. 4,648,209, Cl. 51-90.000.
J. I. Case Company: *See*—
Harms, John R.; and Anderson, Ronald L., 4,648,780, Cl. 414-686.000.
Vater, George R.; and Horsch, Joachim, 4,648,495, Cl. 192-70.120.
J.M. Voith GmbH: *See*—
Wanke, Wilhelm; and Hauser, Ludwig, 4,648,942, Cl. 162-286.000.
Jackson, Keith L., to Lukens General Industries, Inc. Radial axle railway truck with axle couplings at sides transversely interconnected with each other. 4,648,326, Cl. 105-168.000.
Jacob, Peter, to Mediplast AB. Suction catheter. 4,648,871, Cl. 604-149.000.
Jacobi, Dennis M.: *See*—
Peck, Michael C.; and Jacobi, Dennis M., 4,648,905, Cl. 106-24.000.
Jacobs, Mark D. Can opener. 4,648,183, Cl. 30-400.000.
Jacobson, Robert L.; and Jossens, Lawrence W., to Chevron Research Company. Method of producing high aromatic yields through aromatics removal and recycle of remaining material. 4,648,961, Cl. 208-138.000.
Jacquot, Alain; and Charpentier, Jacques, to SKF Compagnie d'Applications Mechaniques; and Framatome. Method and apparatus for machining a groove around a tubular member. 4,648.294, Cl. 82-4.00R.
Jaegermann, Wolfram: *See*—
Tributsch, Helmut; Ennaoui, Ahmed; Jaegermann, Wolfram; and Fiechter, Sebastian, 4,649,227, Cl. 136-252.000.
Jahns, Thomas M., to General Electric Company. Flux-weakening regime operation of an interior permanent magnet synchronous motor. 4,649,331, Cl. 318-798.000.
James C. Barber and Associates, Inc.: *See*—
Barber, James C., 4,649,035, Cl. 423-317.000.
James, Henry E.: *See*—
Daus, John J., Jr.; and James, Henry E., 4,648,734, Cl. 403-170.000.
James Howden & Company Limited: *See*—
Wilson, Robert R., 4,648,801, Cl. 416-171.000.
James River Corporation of Virginia: *See*—
VanderLugt, Thomas, 4,648,536, Cl. 225-43.000.
Janome Sewing Machine Co., Ltd.: *See*—
Hanyu, Susumu; Kata, Kenji; and Takahashi, Yoshitaka, 4,648,340, Cl. 112-447.000.
Kato, Kenji; Yamaguchi, Yoshio; and Takahashi, Yoshitaka, 4,648,341, Cl. 112-458.000.
Jans, Herbert, to Siemens Aktiengesellschaft. Circuit arrangement for telecommunications exchange systems, particularly telephone exchange systems, comprising information processing sequential logic systems and traffic measuring devices. 4,649,234, Cl. 379-138.000.
Janson, David A., to Ford Motor Company. Gear shift control mechanism. 4,648,283, Cl. 74-477.000.
Janssen Pharmaceutica, N.V.: *See*—
Van Dijck, Paul C. M.; Ligtvoet, Theo F. M. C.; and Van Leemput, Leo J. J., 4,648,988, Cl. 252-602.000.
Japan Styrene Paper Corporation: *See*—
Nakamura, Hisao; and Iwano, Shoji, 4,649,001, Cl. 264-50.000.
Japanese National Railways: *See*—
Kitta, Toshiyuki; Tada, Hiroshi; and Ishikawa, Keizo, 4,648,224, Cl. 52-223.00R.
Jarrett, Steven M.: *See*—
Carlson, Lee R.; Hegedus, Denes A.; Jarrett, Steven M.; Miller, Michael F.; Riley, Martin E.; and Wright, David L., 4,649,547, Cl. 372-61.000.
Jawor, John C. Draining down of a nuclear steam generating system. 4,649,019, Cl. 376-316.000.
Jefferson Smurfit Corporation: *See*—
Trutna, Maynard A., 4,648,549, Cl. 229-143.000.
Jegers, Martin P.: *See*—
Chang, Victor A.; Reyes, Angel A.; Jegers, Martin P.; and Valias-Jean, Frantz, 4,649,092, Cl. 429-217.000.
Jegousse, Michel: *See*—
Puisais, Xavier F.; Hamon, Jean-Pierre; Jegousse, Michel; and Kaluszynski, Michel, 4,648,544, Cl. 228-44.500.
Jenkins, Waylon L.; Hodge, Deborah T.; and Sampson, Kendree J., to Eastman Kodak Company. Process for preparing copolymers of ethylene and vinyl acetate. 4,649,186, Cl. 526-87.000.
Jennesa, Raymond C., to Allis-Chalmers Corporation. Grinding mill apparatus. 4,648,561, Cl. 241-34.000.
Jensen, Finn U. H., to Kongskilde Koncernselskab A/S. Resiliently mounted earth smoothing roller. 4,648,465, Cl. 172-551.000.
Jensen, Robert M. Top inlet baghouse construction. 4,648,889, Cl. 55-341.0NT.
Jeumont-Schneider Corporation: *See*—
Gabillet, Jean-Francois, 4,649,469, Cl. 364-130.000.
Jirousek, Ludek: *See*—
Garlick, Russell K.; and Jirousek, Ludek, 4,649,039, Cl. 424-1.100.
jmh Holdings Limited: *See*—
Moorhouse, David, 4,648,655, Cl. 297-331.000.
Jochum, Philip. Device in fluid pressure generators. 4,648,788, Cl. 415-91.000.
Johansson, Hans: *See*—
Gillbrand, Per; Johansson, Hans; and Nytomt, Jan, 4,648,367, Cl. 123-425.000.
John Fluke Mfg. Co., Inc.: *See*—
Carlson, Alden J.; and Bhaskar, Kasi S., 4,649,497, Cl. 364-491.000.
Johnson, Carl A.; and Robinson, S. M. Boris, to Sirris Flow Technology, Inc. Mass flowmeter. 4,648,270, Cl. 73-202.000.
Johnson, Eric C., to Owens-Illinois, Inc. Blow molding apparatus. 4,648,831, Cl. 425-540.000.
Johnson, Michael J.; and Hancock, William R., to Sperry Corporation. Binary character generator for interlaced CRT display. 4,649,378, Cl. 340-728.000.
Johnson, Peter E.; and Young, James, to Entek Manufacturing Inc. Apparatus for degressing a continuous sheet of thin material. 4,648,417, Cl. 134-105.000.
Johnson, Porter C., to Bristol-Myers Company. Novel bile sequestrant resin. 4,649,048, Cl. 424-81.000.
Johnson, Roger N., to United States of America, Energy. Low friction and galling resistant coatings and processes for coating. 4,649,086, Cl. 428-627.000.
Johnston, Franklin R., *Sr.*, to Memorial Management and Marketing Concepts, Inc. Lawn crypt. 4,648,219, Cl. 52-131.000.
Johnston, Orin B. Method of forming bead seal in biaxially oriented polymer film by heat bonding. 4,648,931, Cl. 156-251.000.
Johnstone, Thomas O.; and Dawe, Thomas W., to Alcan Aluminum Corp. Method of making interlocking vinyl siding. 4,649,008, Cl. 264-177.100.
Jones, Daryl P.: *See*—
Hunjan, Harjit S.; and Jones, Daryl P., 4,648,794, Cl. 415-170.00B.
Jones, Gary A.; Rees, Raymond M.; and Zato, Thomas J., to Zenith Electronics Corporation. Digital TV with low cost auxiliary device communication system. 4,649,428, Cl. 358-188.000.
Jones, J. Ivor, to Kaydon Corporation. Bearing weld ring. 4,648,729, Cl. 384-615.000.
Jones, Mark; and Letrich, George, to Intel Corporation. Aspirator pump device for use in semiconductor processing. 4,648,804, Cl. 417-87.000.
Jones, Raymond T., to Eastman Kodak Company. Rapid-drying recording element for liquid ink marking. 4,649,064, Cl. 427-256.000.
Jones, Stanley G., to Rizla Limited. Machine for making paper booklets. 4,648,862, Cl. 493-346.000.
Jones, Timothy A.: *See*—
Snavely, Earl S., Jr.; and Jones, Timothy A., 4,649,032, Cl. 423-226.000.
Jongenburger, Huibert S.: *See*—
Armstrong, Robert B.; Jongenburger, Huibert S.; and Sadhukhan, Pasupati, 4,648,999, Cl. 261-77.000.
Jonsson, Lars: *See*—
Hok, Bertil; and Jonsson, Lars, 4,649,271, Cl. 250-227.000.
Joseph Pollak Corporation: *See*—
Beck, Willi K.; and Strange, Andrew, 4,649,238, Cl. 200-16.00C.
Joseph, Ponnattu K.: *See*—
Wisdom, Lawrence W.; and Joseph, Ponnattu K., 4,648,296, Cl. 83-13.000.
Jossens, Lawrence W.: *See*—
Jacobson, Robert L.; and Jossens, Lawrence W., 4,648,961, Cl. 208-138.000.
Jost, Leonora. Transdermal and transmucosal vortexed foam devices and the method of making. 4,649,075, Cl. 428-305.500.
Jouanneau, Jean-Francois: *See*—
Herve, Jean-Luc; Jouanneau, Jean-Francois; Kristensen, Ivar G.; and Haugen, Finn, 4,648,419, Cl. 137-245.500.
Joubert, Philippe, to Uranium Pechiney. Process for the purification of uraniferous and/or molybendiferous amino organic solutions which contain zirconium and/or hafnium among other impurities. 4,649,030, Cl. 423-9.000.
Joy Manufacturing Company: *See*—
Haynes, Charles W.; and Gault, Frank W., 4,648,292, Cl. 81-57.160.
Hunjan, Harjit S.; and Jones, Daryl P., 4,648,794, Cl. 415-170.00B.
Ju, Fred: *See*—
Kay, Robert E.; Chan, Hakchill; Ju, Fred; and Bray, Burton A., 4,648,917, Cl. 148-175.000.
Juhling, Dieter, to Sulzer Brothers Limited. Bayonet coupling for hollow cylindrical members. 4,648,635, Cl. 285-361.000.
Jung, Eggert: *See*—
Hoffrichter, Ingo; Jung, Eggert; and Keller, Hans, 4,649,423, Cl. 358-80.000.
Jungnell, Jarl O.; and Skold, Bo P., to Molnlycke AB. Collapsible wheelchair chassis. 4,648,619, Cl. 280-650.000.
Junkosha Co., Ltd.: *See*—
Suzuki, Hirosuke, 4,649,228, Cl. 174-36.000.
Juurmaa, Kimmo: *See*—
Collins, Geoff; and Juurmaa, Kimmo, 4,648,342, Cl. 114-40.000.
K.L.+M Industria E Comercio S/P: *See*—
Ladeira, Newton C.; De Oliveria, Paulo R. M.; Marante, Adilson P.; and Krepel, Pedro A., 4,649,033, Cl. 423-242.000.

Kable, Robert G.: *See*—
Nakamura, Shiochiro; and Kable, Robert G., 4,649,232, Cl. 178-18.000.

Kabushiki Kaisha Bandai: *See*—
Kimura, Shigeo, 4,648,487, Cl. 185-39.000.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Asano, Kazuhiko; Takezoe, Osamu; Yasuda, Yoshinori; Hayashi, Kenji; Aoki, Masanobu; Doi, Yoshio; and Shimata, Makoto, 4,648,918, Cl. 148-439.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Sakurai, Terushige, 4,648,786, Cl. 414-752.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Takeda, Nobuhiro; and Hattori, Masaichi, 4,649,286, Cl. 307-10.00R.

Kabushiki Kaisha Toshiba: *See*—
Iwase, Taira; Ariizumi, Shoji; and Masuoka, Fujio, 4,649,412, Cl. 357-41.000.
Konishi, Satoshi, 4,649,291, Cl. 307-297.000.
Kunii, Hideo; and Matsumoto, Katsumi, 4,649,442, Cl. 360-72.200.
Miura, Kunihiko, 4,649,403, Cl. 346-160.000.
Nakajima, Kihei, 4,649,334, Cl. 323-299.000.
Suzuki, Toshiyuki; and Nishikawa, Reiji, 4,649,073, Cl. 428-212.000.
Tachibana, Natsuki; and Ichihara, Issey, 4,648,705, Cl. 355-15.000.
Tahata, Masahiro; and Washizu, Hirokazu, 4,648,811, Cl. 417-410.000.
Watanabe, Junji, 4,649,437, Cl. 358-286.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Noguchi, Yoshikazu; Yokoi, Tatsuhisa; Takeya, Eisaku; and Osawa, Hideyuki, 4,648,373, Cl. 123-568.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Tajima, Ichiro; and Yamamoto, Minoru, 4,649,071, Cl. 428-212.000.

Kagerer, Franz: *See*—
Geiger, Michael; Finsterwalder, Bernd; and Kagerer, Franz, 4,648,172, Cl. 29-568.000.

Kageyama, Toshinobu: *See*—
Oumi, Takeharu; Kageyama, Toshinobu; and Mushika, Sadahiko, 4,648,385, Cl. 128-1.00D.

Kai, Takayuki, to Daiwa Can Company, Limited. Blank guide device of resistance welding machine for seam welding of can body. 4,649,251, Cl. 219-64.000.

Kaizer, Adrianus J. M.; Sangster, Frederik L. J.; and Wesche, Cornelis A. M., to U.S. Philips Corporation. Electro-acoustic converter with compensated frequency response characteristic. 4,649,565, Cl. 381-90.000.

Kakuma, Hideaki: *See*—
Kuwano, Hiroaki; Matsushita, Toshiro; Kakuma, Hideaki; and Motomiya, Teruaki, 4,648,580, Cl. 251-129.010.

Kali-Chemie Pharma GmbH: *See*—
Zeugner, Horst; Romer, Dietmar; Liepmann, Hans; and Milkowski, Wolfgang, 4,649,137, Cl. 514-221.000.

Kallin, Fredrik L. N.: *See*—
Osmera, Miroslav S.; Bella, Anton; Kallin, Fredrik L. N.; and Evans, Edward R., 4,648,591, Cl. 271-305.000.

Kaltenbach, Karl W.; Rettew, Stephen; Rudy, John O.; and Szakacs, Gabor L., to Medica Corporation. Electrolyte analyzer. 4,649,028, Cl. 422-100.000.

Kaltenbach & Voigt GmbH & Co.: *See*—
Schlachter, Siegfried, 4,648,838, Cl. 433-29.000.

Kaluszynski, Michel: *See*—
Puissais, Xavier F.; Hamon, Jean-Pierre; Jegousse, Michel; and Kaluszynski, Michel, 4,648,544, Cl. 228-44.500.

Kamen, Dean L. Volumetric pump with replaceable reservoir assembly. 4,648,872, Cl. 604-155.000.

Kameya, Kazuo, to Elmec Corporation. Compactly constructed electromagnetic delay line. 4,649,356, Cl. 333-138.000.

Kamio, Hideo: *See*—
Itoh, Hiroshi; Nitta, Atsuhiko; Tanaka, Tomio; and Kamio, Hideo, 4,649,219, Cl. 564-207.000.

Kanegafuchi Kagaku Kogyo Kabushiki: *See*—
Uchino, Hayashi; Azuma, Masaaki; Ohashi, Takehisa; and Watanabe, Kiyoshi, 4,649,197, Cl. 544-258.000.

Kaneko, Shuzo: *See*—
Tamura, Yasuyuki; Kaneko, Shuzo; and Takahashi, Tohru, 4,649,094, Cl. 430-126.000.

Kaneta, Keisuke, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Method of controlling a fuel injection apparatus. 4,648,371, Cl. 123-492.000.

Kanezashi, Takeshi: *See*—
Kokubun, Yoshikazu; Hatori, Kunitake; and Kanezashi, Takeshi, 4,648,313, Cl. 99-289.00R.

Kansai Paint Company, Limited: *See*—
Inoue, Hiroshi; and Sasaki, Yoshio, 4,649,175, Cl. 525-38.000.

Kantor, Sidney; and Kennett, Robert L., Jr., to American Cyanamid Company. Methods and compositions for treating protozoal infections with a novel antibiotic. 4,649,143, Cl. 514-279.000.

Kanuma, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Floating-point arithmetic operation system. 4,649,508, Cl. 364-748.000.

Kao, Chiiming: *See*—
Yeung, Hong-Ning; Kao, Chiiming; and Lent, Arnold H., 4,649,346, Cl. 324-309.000.

Kao, Jar-Lin: *See*—
Poeppelmeier, Kenneth R.; Funk, Walter G.; Steger, John J.; Fung, Shun C.; Cross, Virginia R.; and Kao, Jar-Lin, 4,648,960, Cl. 208-138.000.

Karlsson, Kurt O.; and Karlsson, Leif E., to Santrade Limited. Drill and cutting insert therefor. 4,648,760, Cl. 408-223.000.

Karlsson, Leif E.: *See*—
Karlsson, Kurt O.; and Karlsson, Leif E., 4,648,760, Cl. 408-223.000.

Kasahara, Yasushi; Ashihara, Yoshihiro; and Suzuki, Hiromasa, to Fujirebio Kabushiki Kaisha. Method of measuring biological ligand. 4,649,105, Cl. 435-5.000.

Kasai, Toshiyuki: *See*—
Mizutani, Norio; and Kasai, Toshiyuki, 4,648,695, Cl. 353-28.000.

Kassay, Joseph E.: *See*—
Landis, Robert; and Kassay, Joseph E., 4,648,393, Cl. 128-200.230.

Kast, Philip J.: *See*—
Kayser, John P.; and Kast, Philip J., 4,648,486, Cl. 184-15.100.

Kastlunger, Siegfried, to Motorenfabrik Hatz GmbH & Co. KG. Decompression arrangement for a combustion engine. 4,648,362, Cl. 123-182.000.

Kaswan, Renee, to University of Georgia Research Foundation, Inc. Ophthalmic treatment by topical administration of cyclosporin. 4,649,047, Cl. 424-78.000.

Kaszanitzky, Ferenc: *See*—
Matyas, Bela; Gerber, Pal; Solymos, Andras; Kaszanitzky, Ferenc; Panto, Gyorgy; and Leffler, Janos, 4,649,031, Cl. 423-20.000.

Kata, Kenji: *See*—
Hanyu, Susumu; Kata, Kenji; and Takahashi, Yoshitaka, 4,648,340, Cl. 112-447.000.

Katahira, Masayuki, to Nippon Seiko Kabushiki Kaisha. Linear guide device. 4,648,726, Cl. 384-45.000.

Katayama, Masayoshi: *See*—
Morita, Yutaka; Katayama, Masayoshi; and Kato, Takashi, 4,648,281, Cl. 73-861.910.

Kato, Heizaburou; and Anma, Masao, to Sankyo Manufacturing Company, Ltd. Power transmitting device. 4,648,288, Cl. 74-798.000.

Kato, Kenji; Yamaguchi, Yoshio; and Takahashi, Yoshitaka, to Janome Sewing Machine Co., Ltd. Computerized sewing machine. 4,648,341, Cl. 112-458.000.

Kato, Mari: *See*—
Mitsui, Kotaro; Kato, Mari; Oda, Takao; and Yoshida, Susumu, 4,649,088, Cl. 428-697.000.

Kato, Minoru: *See*—
Ota, Kazuomi; Kato, Minoru; Narita, Seiichi; and Moriya, Mitutoshi, 4,649,282, Cl. 250-574.000.

Kato, Takashi: *See*—
Morita, Yutaka; Katayama, Masayoshi; and Kato, Takashi, 4,648,281, Cl. 73-861.910.

Katogi, Kozo: *See*—
Masuda, Mitsuhiro; Igarashi, Osamu; Tokuyama, Keiichi; and Katogi, Kozo, 4,649,381, Cl. 340-784.000.

Katsumata, Shigeo: *See*—
Ishii, Shinzo; Katsumata, Shigeo; Arai, Yukou; Fujimoto, Kazuhisa; and Morimoto, Makoto, 4,649,199, Cl. 544-342.000.

Katz, Alan J.: *See*—
Thompson, Arthur H.; and Katz, Alan J., 4,648,261, Cl. 73-38.000.

Katz, Joel D.: *See*—
Kim, Jonathan J.; and Katz, Joel D., 4,649,002, Cl. 264-58.000.

Kawade, Tateo, to Honda Giken Kogyo Kabushiki Kaisha. Height adjusting device for vehicle seat. 4,648,575, Cl. 248-371.000.

Kawaguchi, Akiko: *See*—
Takasuka, Yutaka; Mohri, Kunihiko; and Kawaguchi, Akiko, 4,648,908, Cl. 106-308.00F.

Kawakami, Hideaki: *See*—
Kitazima, Masaaki; Kawakami, Hideaki; and Nagae, Yoshiharu, 4,649,517, Cl. 365-108.000.

Kawamura, Fumio: *See*—
Uetake, Naohito; Kawamura, Fumio; Yusa, Hideo; Kikuchi, Makoto; and Tamata, Shin, 4,648,990, Cl. 252-628.000.

Kawasaki, Hiroshi: *See*—
Mukunoki, Yasuo; Yokoyama, Shigeki; Kawasaki, Hiroshi; Nemori, Ryoichi; and Takeuchi, Tetsuo, 4,649,102, Cl. 430-527.000.

Kawasaki Steel Corporation: *See*—
Morita, Masahiko; and Hashimoto, Osamu, 4,648,916, Cl. 148-128.000.

Kawasaki Yucoh Co., Ltd.: *See*—
Yashima, Tsuneaki, 4,648,823, Cl. 425-150.000.

Kawata, Ken: *See*—
Yabuki, Yoshiharu; Sato, Kozo; Kawata, Ken; and Hirai, Hiroyuki, 4,649,103, Cl. 430-570.000.

Kawate, Kenji: *See*—
Yamaguchi, Hiroshi; Tanaka, Teruaki; Hirai, Masatake; Kohketsu, Tadashi; Matsumoto, Masahiro; and Kawate, Kenji, 4,649,248, Cl. 219-10.570.

Kawazoe, Michio. Adapter for tripods. 4,648,697, Cl. 354-293.000.

Kawczynski, Gregory: *See*—
Tan, Patrick; Maitland, Peter; Kawczynski, Gregory; and Camposeo, Paul V., 4,648,783, Cl. 414-730.000.

Kay, Robert E.; Chan, Hakchill; Ju, Fred; and Bray, Burton A., to Ford Aerospace & Communications Corporation. Non isothermal method for epitaxially growing HgCdTe. 4,648,917, Cl. 148-175.000.

Kayakabe, Nobuhiro; Sugiura, Tadashi; and Sugimoto, Hitoshi, to Aisin Seiki Kabushiki Kaisha. Method of making a poly-V ribbed pulley. 4,648,163, Cl. 29-159.00R.

Kaydon Corporation: *See*—
Jones, J. Ivor, 4,648,729, Cl. 384-615.000.

Kayser, John P.; and Kast, Philip J., to Madison-Kipp Corporation. Apparatus for lubricating a moving chain. 4,648,486, Cl. 184-15.100.

Kazama, Norio: *See*—
Shigesada, Masaaki; and Kazama, Norio, 4,648,648, Cl. 296-37.160.

Kazlauskas, Gasparas. Pipe welder. 4,649,250, Cl. 219-60.00A.

Keates, Richard H.: *See*—
Schneider, Richard T.; and Keates, Richard H., 4,648,400, Cl. 128-303.100.

Kedem, Gershon; and Ellis, John L., to University of Rochester, The. Computer systems for curve-solid classification and solid modeling. 4,649,498, Cl. 364-518.000.

Kehlenbach, Gunther, to H. Krantz, GmbH & Co. Machine for dyeing, finishing and impregnating a spread of fabric web. 4,648,251, Cl. 68-15.000.

Kekelia, Dzhemal I.: *See*—
Gaprindashvili, Khanzerifa I.; Kogan, Vadim E.; Kekelia, Dzhemal I.; Pronkin, Alexei A.; Salukvadze, Nana A.; Bakuradze, Georgy V.; and Evstropiev, Konstantin K., deceased, 4,649,126, Cl. 501-43.000.

Kekich, Ivica J. Foldable sled or toboggan. 4,648,611, Cl. 280-20.000.

Keich, Heinz, to Mannesmann Kienzle GmbH. Hose connection. 4,648,634, Cl. 285-356.000.

Kelleghan, William J.: *See*—
Lau, Kreisler S. Y.; and Kelleghan, William J., 4,649,207, Cl. 549-563.000.

Keller, Guido; Spiess, Andreas; Ott, Hans; and Boegli, Rolf, to Gretag Aktiengesellschaft. Process and apparatus for evaluating printing quality and for regulating the ink feed controls in an offset printing machine. 4,649,502, Cl. 364-519.000.

Keller, Hans: *See*—
Hoffrichter, Ingo; Jung, Eggert; and Keller, Hans, 4,649,423, Cl. 358-80.000.

Keller, Harold T.: *See*—
Castner, Raymond P.; Olechovsky, David F.; Brown, Philip S.; Sinha, Susanta; Keller, Harold T.; and Cheng, Wenche W., 4,649,493, Cl. 364-472.000.
Sinha, Susanta; Brown, Philip S.; Harman, Douglas G.; Keller, Harold T.; Olechovsky, David F.; and Cheng, Wenche W., 4,649,492, Cl. 364-472.000.

Keller, Reinhold; and Schlingmann, Merten, to Hoechst Aktiengesellschaft. Process for the preparation of 5-ribonucleotides. 4,649,111, Cl. 435-89.000.

Keller, Rene, to Emhart Industries, Inc. Inspection apparatus for inspecting articles moving on a conveyor. 4,649,503, Cl. 364-552.000.

Kelly, Gordon E.; Krishnamurthy, Gopalan; and Rypkema, Jouke N., to Zenith Electronics Corporation. Automatic frequency response correction using color burst. 4,649,420, Cl. 358-38.000.

Kelly, John C., to Texas Instruments Incorporated. MOS integrated circuit having a metal programmable matrix. 4,649,413, Cl. 357-41.000.

Kelman, Charles D. Posterior chamber lens implant. 4,648,878, Cl. 623-6.000.

Kelman, Charles D. Posterior chamber intraocular lens. 4,648,879, Cl. 623-6.000.

Kelso, William C.: *See*—
Hein, Richard W.; and Kelso, William C., 4,649,065, Cl. 427-370.000.

Kempel, Francis D.: *See*—
Schmitt, Ray F.; Gavin, Joseph A.; Kempel, Francis D.; and Waltrick, Charles N., deceased, 4,649,281, Cl. 250-574.000.

Kempken, Rainer; Steinberger, Josef; and Ritschel, Johann, to Paul Forkardt GmbH & Co. KG. Apparatus for changing the top jaws of a chuck. 4,648,170, Cl. 29-568.000.

Kennecott Corporation: *See*—
Kim, Jonathan J.; and Katz, Joel D., 4,649,002, Cl. 264-58.000.

Kennedy, Kenneth R., to Sunbeam Plastics Corporation. Vented closure. 4,648,519, Cl. 215-261.000.

Kennematel, Inc.: *See*—
Mitchell, Robert N.; and Hunt, James L., 4,648,761, Cl. 29-558.000.

Kennett, Robert L., Jr.: *See*—
Kantor, Sidney; and Kennett, Robert L., Jr., 4,649,143, Cl. 514-279.000.

Kennon, Jerry M.; Faulkner, James V., Jr.; and York, Theodore H., to Westinghouse Electric Corp. Transceiver with auto frequency sense. 4,649,569, Cl. 455-67.000.

Keogh, Christopher B.: *See*—
Thompson, John A.; and Keogh, Christopher B., 4,649,169, Cl. 524-247.000.

Keough, William R. Apparatus and process for the pyrolysis of tires. 4,648,328, Cl. 110-229.000.

Keren, Hannan, to Elscint, Ltd. Body probes. 4,648,405, Cl. 128-653.000.

Kernohan, Craig D.: *See*—
Baker, Christopher J.; and Kernohan, Craig D., 4,648,466, Cl. 172-260.500.

Kessler, Leland L.: *See*—
Rosswurm, Mark A.; and Kessler, Leland L., 4,649,537, Cl. 371-16.000.

Keycom Electronic Publishing: *See*—
Chorley, William; Redding, Robert; and Fries, Christopher, 4,649,533, Cl. 370-58.000.

Keystone International, Inc.: *See*—
Scobie, William B.; and Wagberg, Michael L., 4,648,418, Cl. 137-67.000.

Khanna, Amarpal S., to Avantek, Inc. Switchable multi-frequency dielectric resonator oscillator. 4,649,354, Cl. 331-99.000.

Kidwell, John H.; Prueter, William P.; and Eaton, Andrew M., to Babcock & Wilcox Company, The. Combination downflow-upflow vapor-liquid separator. 4,648,890, Cl. 55-347.000.

Kiely, Edmond F.: *See*—
Fradenburgh, Evan A.; Kiely, Edmond F.; and Miller, Gordon G., 4,648,800, Cl. 416-134.00A.

Kiesel, Kenneth C.; and Wray, William R., to Polaroid Corporation. Reconstitution of images. 4,649,568, Cl. 382-41.000.

Kii, Toshiyuki: *See*—
Ban, Itsuki; Kii, Toshiyuki; and Mitsuta, Yuji, 4,648,710, Cl. 356-4.000.

Kikuchi, Makoto: *See*—
Uetake, Naohito; Kawamura, Fumio; Yusa, Hideo; Kikuchi, Makoto; and Tamata, Shin, 4,648,990, Cl. 252-628.000.

Kikuchi, Masahiro; Kobori, Yuzuru; and Murakami, Kanemitsu, to Sony Corporation. Electron gun with low spherical aberration. 4,649,318, Cl. 313-449.000.

Kilman, Brenda J.; and Cowart, Betty J. Artificial fingernail applicator tool. 4,648,416, Cl. 132-88.700.

Kilstofte, Richard B., to Fortel, Inc. Drive mechanism for a two-tape telephone answering machine using a single reversible motor. 4,649,562, Cl. 379-70.000.

Kim, Dongsung R., to Burroughs Corporation. Multi-phase subroutine control circuitry. 4,649,472, Cl. 364-200.000.

Kim, In S. Controlling device of a drill for regular and reversed rotation in non-contact type. 4,649,330, Cl. 318-756.000.

Kim, Jin C. Fishing rod assembly. 4,648,195, Cl. 43-22.000.

Kim, Jonathan J.; and Katz, Joel D., to Kennecott Corporation. System for preventing decomposition of silicon carbide articles during sintering. 4,649,002, Cl. 264-58.000.

Kim, Sung B. Golf club with air permeable shaft. 4,648,598, Cl. 273-80.00R.

Kimberly-Clark Corporation: *See*—
Ales, Thomas M., 4,648,928, Cl. 156-164.000.
Newman, William R., 4,648,513, Cl. 206-614.000.
Pierce, Allan A., 4,648,861, Cl. 493-333.000.

Kimura, Shigeo, to Kabushiki Kaisha Pandai. Drive wheel equipped with power spring. 4,648,487, Cl. 185-39.000.

Kimura, Syuzaburo, to Ikeda Bussan Co., Ltd. Car seat. 4,648,656, Cl. 297-337.000.

Kimura, Toshio; Nakagawa, Shuichi; Tokumo, Teruhiko; Yamamoto, Hiroyuki; Kotan, Hiroshi; Otsu, Hiroshi; and Satoh, Tetsuya, to Yokogawa Hokushin Electric Corporation. Pen recorder. 4,649,399, Cl. 346-32.000.

King-Seeley Thermos Co.: *See*—
Tarozzi, Richard A.; and Formhals, Charles, 4,648,512, Cl. 206-542.000.

Kinoshita, Susumu: *See*—
Irikura, Tsutomu; Suzue, Seigo; Uchida, Hiroaki; Shinoda, Hirotaka; Murayama, Satoshi; and Kinoshita, Susumu, 4,649,198, Cl. 544-281.000.

Kinoshita, Tsuyoshi, to Mitsubishi Denki Kabushiki Kaisha. Manipulator device for a reflecting mirror. 4,648,692, Cl. 350-632.000.

Kinze Manufacturing, Inc.: *See*—
Kinzenbaw, Jon E., 4,648,334, Cl. 111-52.000.

Kinzenbaw, Jon E., to Kinze Manufacturing, Inc. Agricultural row crop planter with rear-driven row units. 4,648,334, Cl. 111-52.000.

Kirby, Michael J.: *See*—
Hashish, Mohamed A.; Kirby, Michael J.; and Pao, Yih-Ho, 4,648,215, Cl. 51-439.000.

Kircher, Klaus: *See*—
Kress, Hans-Jurgen; Bottenbruch, Ludwig; Witman, Mark; Kircher, Klaus; Lindner, Christian; and Ott, Karl-Heinz, 4,649,168, Cl. 524-130.000.

Kirin Beer Kabushiki Kaisha: *See*—
Takahashi, Yutaka; and Takahashi, Yasutada, 4,648,424, Cl. 137-504.000.

Kirsch, Howard C., to AT&T Bell Laboratories. Fast column access memory. 4,649,522, Cl. 365-189.000.

Kirsch, Howard C.: *See*—
Holder, Clinton H., Jr.; Kirsch, Howard C.; and Stefany, James H., 4,649,523, Cl. 365-203.000.

Kiselewski, Donald L. Modular structure, stud therefor, and method of construction. 4,648,228, Cl. 52-426.000.

Kiss, Gunter H. Apparatus for three-dimensional moldings. 4,648,934, Cl. 156-443.000.

Kitamura, Hideaki: *See*—
Yamada, Mitsuhiko; and Kitamura, Hideaki, 4,649,500, Cl. 364-518.000.

Kitamura, Yuji; and Mitani, Nobuhiro, to Sanyo Electric Co., Ltd. Charge coupled device for transferring electric charge. 4,649,407, Cl. 357-24.000.

Kitazima, Masaaki; Kawakami, Hideaki; and Nagae, Yoshiharu, to Hitachi, Ltd. Information holding device. 4,649,517, Cl. 365-108.000.

Kitou, Kouji; Ohki, Masashi; and Ohsawa, Michitaka, to Hitachi, Ltd. Voltage stabilizer for a high-voltage generating circuit. 4,649,465, Cl. 363-21.000.

Kitson, Michael J. Ladder anchor. 4,648,482, Cl. 182-108.000.

Kitta, Toshiyuki; Tada, Hiroshi; and Ishikawa, Keizo, to Japanese National Railways; and Oiles Industry Co., Ltd. Tendon for prestressed concrete. 4,648,224, Cl. 52-223.00R.

Kittrell, Carter; Hayes, Gary B.; and Feld, Michael S., to Massachusetts Institute of Technology. Method for making optical shield for a laser catheter. 4,648,892, Cl. 65-4.210.

Kiuchi, Seiji, to Fuji Photo Film Co., Ltd. Magnetic tape winding apparatus. 4,648,562, Cl. 242-56.00A.

Klatt, Alfred; and Reinecke, Erich, to WABCO Westinghouse Fahrzeugbremsen GmbH. Transmission control apparatus and method for

determining shift signals on downhill slopes. 4,648,291, Cl. 74-866.000.

Klein, William J., to Wastechem Corporation. Underwater compressing and cutting apparatus. 4,648,989, Cl. 252-626.000.

Klepper, John R.; Reid, John M.; Miwa, Hirohide; Shimura, Takaki; and Murakami, Keiichi. Apparatus for measuring the characteristics of an ultrasonic wave medium. 4,648,276, Cl. 73-599.000.

Kline, Mark L.: *See*—
Ross, Oakley G.; Kline, Mark L.; and Wedertz, Larry D., 4,648,926, Cl. 156-158.000.

Klumpyan, Joseph N.: *See*—
Ross, Richard J.; and Klumpyan, Joseph N., 4,648,457, Cl. 166-332.000.

Klupfel, Olaf; Frielinghaus, Walter S.; and Scholz, Erhard, to Mollers Maschinenfabrik GmbH. Device for gripping and placing members. 4,648,646, Cl. 294-106.000.

Knabenhaus, Fritz: *See*—
Staheli, Paul; Stahli, Urs; and Knabenhaus, Fritz, 4,648,754, Cl. 406-156.000.

Knapp, Kenneth M. Method and apparatus for positioning optical fibers in a buried conduit. 4,648,744, Cl. 405-154.000.

Knecht, Alfred, to SIG Schweizerische Industrie-Gesellschaft. Packaging machine including a folding, sealing and conveying apparatus. 4,648,236, Cl. 53-234.000.

Knoll, Frank: *See*—
Spinosa, Dominic J.; and Knoll, Frank, 4,648,160, Cl. 24-515.000.

Kobayashi, Hideo; and Tomobe, Norio, to Honda Giken Kogyo Kabushiki Kaisha. Air intake side secondary air supply system for an internal combustion engine. 4,648,374, Cl. 123-587.000.

Kobayashi, Masaharu: *See*—
Nishimura, Keizo; Kobayashi, Masaharu; Okamoto, Hiroo; Noguchi, Takaharu; Arai, Takao; and Shibuya, Toshifumi, 4,649,542, Cl. 371-39.000.

Kobayashi, Masaru; Koyanagi, Hironobu; and Sato, Takahiro, to Toray Silicone Co., Ltd. Method for prodacing a liquid silicone rubber base. 4,649,005, Cl. 264-101.000.

Kobayashi, Nobuyuki; and Hattori, Takashi, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for controlling air-fuel ratio in internal combustion engine. 4,648,370, Cl. 123-489.000.

Kobayashi, Osamu: *See*—
Hashimoto, Tadanori; Hama, Masaaki; and Kobayashi, Osumu, 4,649,003, Cl. 264-63.000.

Kobayashi, Susumu; and Morikawa, Hideyuki, to Terumo Corporation. Method and apparatus for preventing pulsations. 4,648,812, Cl. 417-477.000.

Kobler, Robert J., to AMP Incorporated. Wire seal. 4,648,672, Cl. 339-94.00M.

Kobori, Yuzuru: *See*—
Kikuchi, Masahiro; Kobori, Yuzuru; and Murakami, Kanemitsu, 4,649,318, Cl. 313-449.000.

Koch, Steven R.: *See*—
Zinser, Richard L., Jr.; Silverstein, Seth D.; and Koch, Steven R., 4,649,505, Cl. 379-411.000.

Koci, Zdenek, to Ciba-Geigy Corporation. Solutions of anionic dyes with alkylene glycol mono-alkyl ethers. 4,648,884, Cl. 8-527.000.

Kodama, Takuma; Takahashi, Kenji; Ishibashi, Shizuka; Kudo, Koji; Masuda, Yukihiro; Hombough, Masanori; Miyoshi, Osamu; and Yoshiwara, Kazuhisa, to Hitachi, Ltd.; Hitachi Denshi Kabushiki Kaisha; and Hitachi Video Engineering Inc. Circuit for generating a signal for correcting registration in a color television camera with reduction in generation of shading. 4,649,421, Cl. 358-51.000.

Koenig & Bauer Aktiengesellschaft: *See*—
Michalik, Horst B., 4,648,586, Cl. 270-50.000.

Kogan, Vadim E.: *See*—
Gaprindashvili, Khanzerifa I.; Kogan, Vadim E.; Kekelia, Dzhemal I.; Pronkin, Alexei A.; Salukvadze, Nana A.; Bakuradze, Georgy V.; and Evstropiev, Konstantin K., deceased, 4,649,126, Cl. 501-43.000.

Kohketsu, Tadashi: *See*—
Yamaguchi, Hiroshi; Tanaka, Teruaki; Hirai, Masatake; Kohketsu, Tadashi; Matsumoto, Masahiro; and Kawate, Kenji, 4,649,248, Cl. 219-10.570.

Kohlwey, David E., to Louisiana State Rice Milling Company Inc. Process for producing improved dehydrated rice and product. 4,649,055, Cl. 426-449.000.

Kojima, Yasuyuki; Hamada, Nagaharu; and Hori, Yasuro, to Hitachi, Ltd. Thermal recording apparatus. 4,649,401, Cl. 346-76.0PH.

Kokawa, Ryoichi: *See*—
Tsunoda, Teruo; and Kokawa, Ryoichi, 4,649,566, Cl. 382-1.000.

Kokubun, Yoshikazu; Hatori, Kunitake; and Kanezashi, Takeshi, to Sanden Corporation. Beverage brewing apparatus for a vending machine. 4,648,313, Cl. 99-289.00R.

Kolbenschmidt AG: *See*—
Schellmann, Klaus, 4,648,309, Cl. 92-233.000.

Kollberg, Sten: *See*—
Andersson, Conny; and Kollberg, Sten, 4,648,440, Cl. 164-504.000.

Kolluri, Madhavprasad V., to Signetics Corporation. Multi-step parallel analog-digital converter. 4,649,371, Cl. 340-347.0AD.

Kolmayer, Andre : *See*—
Dehon, Claude; and Kolmayer, Andre , 4,649,020, Cl. 376-419.000.

Komiyama, Choji; and Oishi, Kengo, to Fuji Photo Film Co., Ltd. Magnetic tape cassette storage case. 4,648,507, Cl. 206-232.000.

Komori Printing Machinery Co., Ltd.: *See*—
Tsunoda, Teruo; and Kokawa, Ryoichi, 4,649,566, Cl. 382-1.000.

Kondo, Kazuo; and Sukegawa, Tsuneyuki, to NGK Spark Plug Co., Ltd. Substrate for an integrated circuit. 4,649,070, Cl. 428-209.000.

Kongskilde Koncernselskab A/S: *See*—
Jensen, Finn U. H., 4,648,465, Cl. 172-551.000.

Konishi, Satoshi, to Kabushiki Kaisha Toshiba. Voltage reference circuit for providing a predetermined voltage to an active element circuit. 4,649,291, Cl. 307-297.000.

Koob, Judith L.: *See*—
Guilbault, Lawrence J.; McEntee, Thomas C.; Koob, Judith L.; and Brophy, James F., 4,649,079, Cl. 428-375.000.
McEntee, Thomas C.; Guilbault, Lawrence J.; Brophy, James F.; and Koob, Judith L., 4,649,078, Cl. 428-375.000.

Koos, William M., Jr.: *See*—
Halpern, Peter H.; Mallory, Peter E.; Haug, Paul E.; and Koos, William M., Jr., 4,649,549, Cl. 380-32.000.

Kooy, Richard J.: *See*—
Evans, Timothy J.; and Kooy, Richard J., 4,648,864, Cl. 494-37.000.

Kordich, Michael M.; and Shea, John W., to United States of America, Navy. Fluid pressure discharge safety system. 4,648,461, Cl. 169-60.000.

Korkemeier, Hans, to Dr. Ing. h.c.F. Porsche AG. Hollow ceramic body. 4,648,243, Cl. 60-272.000.

Kosha, Hideaki: *See*—
Ryoke, Katsumi; Yamaguchi, Nobutaka; Takahashi, Masatoshi; Hanai, Kazuko; Kosha, Hideaki; and Tadokoro, Eiichi, 4,649,072, Cl. 428-212.000.

Kosiorek, Raymond S.; and Gatechair, Leslie R., to Ciba-Geigy Corporation. Ultraviolet radiation curable vehicle for ceramic colors, composition and method. 4,649,062, Cl. 427-54.100.

Kosky, Philip G.; Silva, James M.; Brunelle, Daniel J.; and Shannon, Thomas G., to General Electric Company. Reducing phosgenation reaction temperatures. 4,649,210, Cl. 558-265.000.

Kosugi, Masao, to Canon Kabushiki Kaisha. Pattern transfer apparatus. 4,648,708, Cl. 355-53.000.

Kotan, Hiroshi: *See*—
Kimura, Toshio; Nakagawa, Shuichi; Tokumo, Teruhiko; Yamamoto, Hiroyuki; Kotan, Hiroshi; Otsu, Hiroshi; and Satoh, Tetsuya, 4,649,399, Cl. 346-32.000.

Kotani, Kunio; Hayashi, Akio; and Taniguchi, Seiho, to Union Carbide Corporation. Compositions based on mixtures of ethylene-ethyl acrylate copolymers and ethylene-vinyl acetate-vinyl chloride terpolymers. 4,648,986, Cl. 252-511.000.

Kovaleski, John W.; and Lee, Thomas M. Universal tie-down bracket. 4,648,765, Cl. 410-110.000.

Kovaleski, Stanley K., to United Technologies Corporation. Radial scoop construction. 4,648,485, Cl. 184-13.100.

Kowalski, Frank P.; and Scott, Gerald R., to Standex International Corporation. Patient treatment table. 4,648,389, Cl. 128-70.000.

Koyama, Jiro: *See*—
Yoshida, Taizo; Mori, Masaaki; Koyama, Jiro; and Haruna, Masamitsu, 4,648,687, Cl. 350-96.130.

Koyanagi, Hironobu: *See*—
Kobayashi, Masaru; Koyanagi, Hironobu; and Sato, Takahiro, 4,649,005, Cl. 264-101.000.

Kraft, Brett W. Underwater manipulator system. 4,648,782, Cl. 414-735.000.

Kralik, Andrew J., to Siemens Energy & Automation, Inc. Stationary contact assembly for a current limiting circuit breaker. 4,649,242, Cl. 200-147.00R.

Kramer, Henry P. Method and apparatus for coding pictorial information for efficient storage, transmission and reproduction. 4,649,435, Cl. 358-260.000.

Kranzler, Ernst, to Robert Bosch GmbH. Electric motor template-wound coil. 4,649,308, Cl. 310-214.000.

Krause, Horst-Jurgen; Syldatk, Andreas; and Sung, Eric, to Henkel Kommanditgesellschaft auf Aktien. Novel polyglycol ethers and use thereof. 4,648,984, Cl. 252-174.220.

Kreitmeier, Franz, to BBC Brown, Boveri & Company, Limited. Rotor, consisting essentially of a disc requiring cooling and of a drum. 4,648,791, Cl. 415-116.000.

Krepel, Pedro A.: *See*—
Ladeira, Newton C.; De Oliveria, Paulo R. M.; Marante, Adilson P.; and Krepel, Pedro A., 4,649,033, Cl. 423-242.000.

Kress, Hans-Jurgen; Bottenbruch, Ludwig; Witman, Mark; Kircher, Klaus; Lindner, Christian; and Ott, Karl-Heinz, to Bayer Aktiengesellschaft. Process for the preparation of flame-resistant polycarbonate moulding compositions containing tetrafluoroethylene polymers. 4,649,168, Cl. 524-130.000.

Kresse, Franz: *See*—
Osberghaus, Rainer; and Kresse, Franz, 4,648,882, Cl. 8-142.000.

Krinock, Jerome V., to Motorola, Inc. Flexible multiplex system for time division multiplex. 4,649,536, Cl. 370-102.000.

Krishna, Surinder; and Egan, Kulwant, to Fairchild Semiconductor Corporation. Fabrication process employing special masks for the manufacture of high speed bipolar analog integrated circuits. 4,648,909, Cl. 148-1.500.

Krishnamurthy, Gopalan: *See*—
Kelly, Gordon E.; Krishnamurthy, Gopalan; and Rypkema, Jouke N., 4,649,420, Cl. 358-38.000.

Kristensen, Ivar G.: *See*—
Herve, Jean-Luc; Jouanneau, Jean-Francois; Kristensen, Ivar G.; and Haugen, Finn, 4,648,419, Cl. 137-245.500.

Kronich, Peter G., to Tecumseh Products Company. Lubricating oil filtration system for an engine. 4,648,363, Cl. 123-196.00R.

Kross, Robert D., to Hydro Optics, Inc. Air freshener. 4,649,046, Cl. 424-76.000.

Krouglicof, Nicholas; McKinnon, Gordon M.; and Svoboda, Jaroslav, to CAE Electronics, Ltd. Optical position and orientation measurement techniques. 4,649,504, Cl. 364-559.000.

Kubach, Hans: *See*—
Gmelin, Karl; Kubach, Hans; Maisch, Wolfgang; Peters, Klaus-Jurgen; and Schelhas, Peter, 4,648,368, Cl. 123-454.000.

Kubo, Seitoku; Taga, Yutaka; and Nakamura, Shinya, to Toyota Jidosha Kabushiki Kaisha. Idling control system for an automatic transmission providing anti roll back action. 4,648,289, Cl. 74-866.000.

Kudo, Koji: *See*—
Kodama, Takuma; Takahashi, Kenji; Ishibashi, Shizuka; Kudo, Koji; Masuda, Yukihiro; Hombough, Masanori; Miyoshi, Osamu; and Yoshiwara, Kazuhisa, 4,649,421, Cl. 358-51.000.

Kuenzel, Werner, to Henkel Kommanditgesellschaft auf Aktien. Easily dispensable detergency booster cloths and dispenser therefor. 4,648,510, Cl. 206-494.000.

Kuhlmann, Werner, to Blendax-Werke R. Schneider GmbH & Co. Dental filling material comprising polymerizable (meth)acrylic compound, X-ray opaque fillers and microfiller. 4,649,165, Cl. 523-116.000.

Kuipers, Johannes: *See*—
Dolman, Hendrik; and Kuipers, Johannes, 4,649,154, Cl. 514-445.000.

Kuka Schweissanlagen + Roboter GmbH: *See*—
Wiedemann, Kurt; and Schwarz, Werner, 4,648,784, Cl. 414-730.000.

Kumagai, Naotake: *See*—
Wada, Shunichi; Shimomura, Setsuhiro; Kumagai, Naotake; Takizawa, Shozo; Maruyama, Mitsunori; Tatemoto, Minoru; Takada, Hiroyuki; and Harara, Mitsuhiko, 4,648,622, Cl. 280-707.000.

Kunii, Hideo; and Matsumoto, Katsumi, to Kabushiki Kaisha Toshiba. Automatic program selector of a video tape recorder. 4,649,442, Cl. 360-72.200.

Kunze, Kenneth R.: *See*—
Lamb, Walter J.; and Kunze, Kenneth R., 4,648,456, Cl. 166-307.000.

Kunze, Lothar; Greeb, Rolf; and Bender, Ralf, to Alfred Teves GmbH. Fluid control valve. 4,648,420, Cl. 137-312.000.

Kurahashi, Takashi: *See*—
Watanabe, Kenshu; Uchikawa, Tadashi; Takiyama, Masashi; and Kurahashi, Takashi, 4,648,425, Cl. 137-557.000.

Kuraray Co., Ltd.: *See*—
Omura, Ikuo; Higaki, Tatsuhiko; and Yamauchi, Junichi, 4,648,844, Cl. 433-217.100.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,649,133, Cl. 514-42.000.

Kurihara, Junichi: *See*—
Ohki, Masaru; Hirosawa, Toshio; Kurihara, Junichi; and Miyazaki, Katsuto, 4,649,480, Cl. 364-300.000.

Kurii, Masaaki: *See*—
Yamamoto, Akinori; and Kurii, Masaaki, 4,649,398, Cl. 343-903.000.

Kurioka, Akihiko: *See*—
Morishita, Takuya; Kurioka, Akihiko; and Morita, Akihiro, 4,648,150, Cl. 15-389.000.

Kuroki, Syoji: *See*—
Mosbach, Erwin H.; McSherry, Charles K.; and Kuroki, Syoji, 4,648,995, Cl. 260-397.100.

Kurozumi, Seizi: *See*—
Tanaka, Toshio; Hazato, Atsuo; and Kurozumi, Seizi, 4,649,156, Cl. 514-530.000.

Kurtz, Leonard D.; and LiCausi, Joseph, to BioResearch Inc. Air leak detection chamber for drainage device. 4,648,874, Cl. 604-321.000.

Kutes, Simon G.; and Parrott, Stephen L., to Phillips Petroleum Company. Hydrofining process employing a phosphorus containing catalyst. 4,648,963, Cl. 208-216.00R.

Kuusento, Jaakko: *See*—
Ahtola, Unto; and Kuusento, Jaakko, 4,648,467, Cl. 173-107.000.

Kuwano, Hiroaki; Matsushita, Toshiro; Kakuma, Hideaki; and Motomiya, Teruaki, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Direct-drive type electro-hydraulic servo valve. 4,648,580, Cl. 251-129.010.

Kyan, Chwan P.: *See*—
Grazioni, Kenneth R.; and Kyan, Chwan P., 4,648,957, Cl. 208-58.000.

Kyorin Pharmaceutical Co., Ltd.: *See*—
Irikura, Tsutomu; Suzue, Seigo; Uchida, Hiroaki; Shinoda, Hirotaka; Murayama, Satoshi; and Kinoshita, Susumu, 4,649,198, Cl. 544-281.000.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Ishii, Shinzo; Katsumata, Shigeo; Arai, Yukou; Fujimoto, Kazuhisa; and Morimoto, Makoto, 4,649,199, Cl. 544-342.000.
Yamauchi, Takayoshi; Hattori, Kaneaki; Ikeda, Shun-ichi; Nakao, Kenji; and Tamaki, Kentaro, 4,649,213, Cl. 560-56.000.

L Investments, Ltd.: *See*—
Scott, Paul C., 4,648,301, Cl. 83-464.000.

La Radiotechnique: *See*—
Arragon, Jean-Pierre; Cantou, Christian; and Marie, Gerard J. M., 4,649,419, Cl. 380-20.000.

LaBarge, Robert L.; and Heffner, Robert E., to Aluminum Company of America. Easy opening container end closure. 4,648,528, Cl. 220-240.000.

Labes, Mortimer M.; and Chen, Jiann H., to Temple University. Cyanogen polymers and pyropolymers and fibers thereof. 4,649,038, Cl. 423-364.000.

Ladeira, Newton C.; De Oliveria, Paulo R. M.; Marante, Adilson P.; and Krepel, Pedro A., to K,L+M Industria E Comercio S/P. Process to eliminate air pollutants which result from the combustion of fuels containing sulphur. 4,649,033, Cl. 423-242.000.

Lafaye, Marc R. R.: *See*—
Couarc'h, Michel F. E.; Bessouat, Roger; Lafaye, Marc R. R.; and Bernet, Robert R. E., 4,648,329, Cl. 110-245.000.

Lahmeyer, Charles R., to United States of America, National Aeronautics and Space Administration. Reed-Solomon decoder. 4,649,541, Cl. 371-37.000.

Laighton, David G.: *See*—
Borkowski, Michael T.; Laighton, David G.; and Altschul, Barry, 4,649,416, Cl. 357-74.000.

Laimer, Friedrich; and Neugebauer, Hermann, to Netsal-Maschinen AG. Screw plastifying and conveying device of an injection molding machine for plastics. 4,648,827, Cl. 425-208.000.

L'Air Liquide: *See*—
Roux, Michel, 4,648,893, Cl. 65-26.000.

Lake, Ralph J., Jr.; and Iosso, Thomas P., to Burroughs Corporation. Theft prevention apparatus. 4,648,737, Cl. 403-322.000.

Lamb, Walter J.; and Kunze, Kenneth R., to Exxon Production Research Co. Method for acidizing siliceous formations. 4,648,456, Cl. 166-307.000.

La Mers, Herbert. Method of separating labels from a carrier strip. 4,648,930, Cl. 156-247.000.

Lamonica, Mark. Method for making pizza. 4,649,053, Cl. 426-302.000.

Land O'Lakes, Inc.: *See*—
Campbell, Rolf W. J., 4,648,506, Cl. 206-216.000.

Landis, Robert; and Kassay, Joseph E., to Ackrad Laboratories, Inc. Breath activated medication spray. 4,648,393, Cl. 128-200.230.

Landram, Mark O., to United States of America, Air Force. Cryogenic glass-to-metal seal. 4,649,085, Cl. 428-620.000.

Landstingens Inkopscentral, Lic, Ekonomisk Forenting: *See*—
Timerdahl, Ake; and Angseryd, Jan, 4,648,839, Cl. 433-77.000.

Lane, Donald W.: *See*—
Rule, Mark; Larkins, Thomas H., Jr.; Lane, Donald W.; and Steinmetz, Guy R., 4,649,216, Cl. 562-406.000.

Lang, Roger J., to Allied Corporation. Electrical connector assembly and method for terminating cable. 4,648,677, Cl. 339-99.00R.

Langley-Ford Instruments a division of Coulter Electronics of N.E.: *See*—
Ford, Norman C., Jr.; and Ware, Bennie R., 4,648,715, Cl. 356-344.000.

Lanner, Michael; and Coffey, Cynthia L., to Beth Israel Hospital Association, The. Animal cage insert and convertible animal cage. 4,648,351, Cl. 119-17.000.

Lardellier, Alain M. J., to Societe Nationale d'Etude et de Construction de Meteur d'Aviation "S.N.E.C.M.A." . Containment structure for a turbojet engine. 4,648,795, Cl. 415-196.000.

Larkins, Thomas H., Jr.: *See*—
Rule, Mark; Larkins, Thomas H., Jr.; Lane, Donald W.; and Steinmetz, Guy R., 4,649,216, Cl. 562-406.000.

Laroche, Francois X. Structural joint element for panels. 4,648,231, Cl. 52-775.000.

Larson, Conrad M., to Midwest Green Products, Inc. Kitty litter box. 4,648,349, Cl. 119-1.000.

Lassaux, Jean; and Clement, Henry, to Telecommunications Radioelectriques et Telephoniques. Equipment for locating a signal reflection point in a transmission line. 4,649,335, Cl. 324-52.000.

Lassiaz, Philippe: *See*—
Despres, Dominique; and Lassiaz, Philippe, 4,648,499, Cl. 192-98.000.

Lau, Arthur L. Y.: *See*—
Charlton, Steven C.; Hemmes, Paul; and Lau, Arthur L. Y., 4,649,123, Cl. 436-79.000.

Lau, Kreisler S. Y.; and Kelleghan, William J., to Hughes Aircraft Company. Derivatives of diphenylhexafluoropropane. 4,649,207, Cl. 549-563.000.

Lauchenauer, Alfred E., to Adnovum AG. Heat activatable multi-component sheet material & process for making same. 4,649,077, Cl. 428-317.100.

Laumann, Curt W.: *See*—
Sun, Shu S.; and Laumann, Curt W., 4,649,519, Cl. 365-122.000.

Laurello, Vincent P.: *See*—
Baran, Walter J., Jr.; Chaplin, Gary F.; and Laurello, Vincent P., 4,648,792, Cl. 415-139.000.

Laurent, Jean: *See*—
Dedole, Pascal; Grolet, Pierre; and Laurent, Jean, 4,648,478, Cl. 181-106.000.

Lawrence, Alvah A.: *See*—
Diaz, Stephen H.; Debbaut, Christian A. M.; Humphries, William H.; Lawrence, Alvah A.; Ragland, Glen W.; and Shimirak, Gerald L., 4,648,919, Cl. 156-48.000.

Lawson, John R.: *See*—
Alexander, Robert H.; Lawson, John R.; and Falter, Ronald C., 4,648,756, Cl. 408-9.000.

Lawther, Robert J., to Northrop Corporation. Fragmentation munition. 4,648,323, Cl. 102-495.000.

Leblanc, Jean; Pigeroulet, Jean; and Rossignol, Francois, to Robert Bosch GmbH. Pump/nozzle unit for fuel injection in internal combustion engines. 4,648,556, Cl. 239-88.000.

Lee, Dickey, to Alpha Metal Corp. Multipurpose aluminum folding ladder equipped with a detachable stand-on board and supporting handrails. 4,648,481, Cl. 182-28.000.

Lee, Jin P., to Leeco Diagnostics, Inc. Means for determining percentage of glycohemoglobin in whole blood. 4,649,122, Cl. 436-67.000.

Lee, Terry R.: *See*—
Greider, C. Austin; Stephenson, David G.; Lee, Terry R.; and Durfee, John R., 4,648,238, Cl. 56-202.000.

Lee, Thomas M.: *See*—
Kovaleski, John W.; and Lee, Thomas M., 4,648,765, Cl. 410-110.000.

Lee, Wei-long W.; Dorich, Michael J.; and Eerkens, Jeff W., to Melles Griot, San Marcos Company. Compact gas laser having extended life. 4,649,545, Cl. 372-61.000.

Leeco Diagnostics, Inc.: *See*—
Lee, Jin P., 4,649,122, Cl. 436-67.000.

Leffler, Janos: *See*—
Matyas, Bela; Gerber, Pal; Solymos, Andras; Kaszanitzky, Ferenc; Panto, Gyorgy; and Leffler, Janos, 4,649,031, Cl. 423-20.000.

Leger, James R.: *See*—
Veldkamp, Wilfrid B.; Leger, James R.; and Swanson, Gary J., 4,649,351, Cl. 330-4.300.

Leland Stanford Junior University, The Board of Trustees of the: *See*—
Van Compernolle, Dirk S., 4,648,403, Cl. 128-419.00R.

Lemmel, Steven A.: *See*—
Datta, Rathin; and Lemmel, Steven A., 4,649,112, Cl. 435-136.000.

Lempco Industries, Inc.: *See*—
O'Neil, Junior; and Plagens, Leonard D., 4,648,727, Cl. 384-49.000.

Lent, Arnold H.: *See*—
Yeung, Hong-Ning; Kao, Chiiming; and Lent, Arnold H., 4,649,346, Cl. 324-309.000.

Leonard, John A.; and Plumb, Harry A., to General Electric Co. Method for automatic speed loop tune-up in a machine drive. 4,649,328, Cl. 318-317.000.

Leslie Company: *See*—
Muller, John T., 4,648,553, Cl. 236-80.00R.

Lessig, William R., III; Wheeler, Dale K.; Bailey, R. Roby, Jr.; and Smith, Stephen W., to Black & Decker Inc. Variable speed trigger switch. 4,649,245, Cl. 200-157.000.

Lester, Theodore V.: *See*—
Guerin, Thomas R.; and Lester, Theodore V., 4,649,325, Cl. 315-383.000.

Leto, Joseph J.; Gertenbach, Dennis D.; and Gillespie, Daniel W., to Resource Technology Associates. Separation of hydrocarbons from tar sands froth. 4,648,964, Cl. 208-390.000.

Letrich, George: *See*—
Jones, Mark; and Letrich, George, 4,648,804, Cl. 417-87.000.

Leuthner, Hermann J.: *See*—
Alender, Wolfgang J.; Anders, Heinz-Gerhard; and Leuthner, Hermann J., 4,648,282, Cl. 73-862.230.

Levenstein, Victor M.: *See*—
Mann, John P.; Levenstein, Victor M.; and Fox, Charles H., 4,648,660, Cl. 299-10.000.

Lever Brothers Company: *See*—
Parslow, Michael W.; and Nooi, Jacobus R., 4,648,979, Cl. 252-8.800.

Levine, Stephen N., to Motorola, Inc. Synchronization sequence decoder for a digital radiotelephone system. 4,649,543, Cl. 371-41.000.

Levitt-Safety Limited: *See*—
Moore, Derek V., 4,649,333, Cl. 320-31.000.

Lew, Hyok S. Spiral coil target flow meter. 4,648,278, Cl. 73-861.710.

Lewis Galoob Toys, Inc.: *See*—
Siegfried, Rand, 4,648,853, Cl. 446-448.000.

Lewis, Robert T.; Sullivan, James W.; Milliner, Kenneth M.; and Lowe, Byron L., to Brown & Williamson Tobacco Corporation. Apparatus for manufacturing a cigarette filter tow. 4,648,858, Cl. 493-4.000.

Ley, Hans; Neumock, Udo; Scholz, Peter; Seidler, Horst; Berghaus, Horst; and Schmidt, Manfred. Method for producing workpieces having polygonal outer and/or inner contours and apparatus for implementing the method. 4,648,295, Cl. 82-18.000.

Leybold-Heraeus GmbH: *See*—
Aichert, Hans; Bauer, Volker; Feuerstein, Albert; and Ranke, Horst, 4,648,347, Cl. 118-720.000.

Leyrer, Reinhold J.; Wegner, Gerhard; and Mueller, Michael, to BASF Aktiengesellschaft. Production of resist images, and a suitable dry film resist. 4,649,100, Cl. 430-326.000.

LiCausi, Joseph: *See*—
Kurtz, Leonard D.; and LiCausi, Joseph, 4,648,874, Cl. 604-321.000.

Licentia Patent-Verwaltungs-GmbH: *See*—
Minker, Manfred; and Rohling, Hermann, 4,649,394, Cl. 342-94.000.
Rogowsky, York, 4,649,466, Cl. 363-35.000.

Lien, Darryl A. Flagging dispenser. 4,648,538, Cl. 225-78.000.

Liepmann, Hans: *See*—
Zeugner, Horst; Romer, Dietmar; Liepmann, Hans; and Milkowski, Wolfgang, 4,649,137, Cl. 514-221.000.

Lightolier Incorporated: *See*—
Pearlman, Gordon W.; and Carlson, Steven B., 4,649,323, Cl. 315-307.000.

Ligtvoet, Theo F. M. C.: *See*—
Van Dijck, Paul C. M.; Ligtvoet, Theo F. M. C.; and Van Leemput, Leo J. J., 4,648,988, Cl. 252-602.000.

Lilja, Launo L.: *See*—
Hultholm, Stig-Erik; Lilja, Launo L.; Makitalo, Valto J.; and Nyman, Bror G., 4,648,973, Cl. 210-629.000.

Liljestrom, William P.: *See*—
Rolle, Thomas E.; Nebel, David J.; Shulan, John L.; and Liljestrom, William P., 4,648,560, Cl. 241-24.000.

Lima, Joseph V.; and Shea, Richard J., to GTE Products Corporation. Low-pressure arc discharge lamp having a common passageway and method of manufacturing same. 4,648,850, Cl. 445-22.000.

Limp, Edgar W. Suspended ceiling system having tiles with interspersed hooks resting on runners. 4,648,229, Cl. 52-484.000.

Lindgren, Sten O. T.: *See*—
Strongert, Lars H.; and Lindgren, Sten O. T., 4,648,431, Cl. 141-18.000.

Lindner, Christian: *See*—
Kress, Hans-Jurgen; Bottenbruch, Ludwig; Witman, Mark; Kircher, Klaus; Lindner, Christian; and Ott, Karl-Heinz, 4,649,168, Cl. 524-130.000.

Lindsey, John S.: *See*—
Henslee, Walter W.; Morrow, Stanley J.; and Lindsey, John S., 4,648,954, Cl. 204-243.00R.

Ling, Daniel T.: *See*—
Chung, Paul W.; Matick, Richard E.; and Ling, Daniel T., 4,649,516, Cl. 364-900.000.

Linke, George A., to Ampex Corporation. Modular multichannel magnetic head assembly with accurate channel locations. 4,649,450, Cl. 360-129.000.

Linton, Steven C.: *See*—
Heaton, Richard D.; and Linton, Steven C., 4,649,397, Cl. 343-895.000.

Lion Corporation: *See*—
Gomi, Tetsuo; Suganuma, Nobuo; Ishii, Kazuo; and Sato, Hiroshi, 4,649,044, Cl. 424-49.000.

Lipha, Lyonnaise Industrielle Pharmaceutique: *See*—
Ferrand, Gerard; Barbanton, Jacques; and Depin, Jean-Claude, 4,649,153, Cl. 514-443.000.

Lipkowski, Andrzej W.: *See*—
Portoghese, Philip S.; and Lipkowski, Andrzej W., 4,649,200, Cl. 546-26.000.

Lipschutz, Paul, to Neiman S.A. Key operated lock mechanism with mixed mechanical and electric control. 4,649,272, Cl. 250-229.000.

Liquipak International B.V.: *See*—
Chant, Nigel A.; Mosse, Richard W. E.; and Bunce, Kevin, 4,648,421, Cl. 137-312.000.

Litovitz, Theodore A.: *See*—
Barkatt, Aaron; and Macedo, Pedro B., 4,648,975, Cl. 210-656.000.

Litton Resources Systems: *See*—
Porter, James A., Jr., 4,649,530, Cl. 367-154.000.

Llewelyn, Roger J.: *See*—
Canton, David A.; Holloway, Brian L.; Sargeant, Nicholas B.; and Llewelyn, Roger J., 4,649,379, Cl. 340-750.000.

Locke, Gilbert E.: *See*—
Mattis, John S.; Berth, Jorgen; and Locke, Gilbert E., 4,648,684, Cl. 339-177.00R.

Long, Donald. Football place kicking apparatus and method. 4,648,596, Cl. 273-55.00B.

Losch, Dieter, to Gebr. Buhler Nachfolger GmbH. Rear view mirror. 4,648,693, Cl. 350-636.000.

Loucks, Larry K.: *See*—
Advani, Hira; Loucks, Larry K.; and Springen, Nancy L., 4,649,479, Cl. 364-300.000.

Louisiana State Rice Milling Company Inc.: *See*—
Kohlwey, David E., 4,649,055, Cl. 426-449.000.

Louth, Kenneth, to Ampex Corporation. Head reel servo system in a recording and/or reproducing apparatus. 4,649,441, Cl. 360-71.000.

Lovell, Gregory R., to AMP Incorporated. Electrical connector. 4,648,666, Cl. 339-17.0CF.

Lovering, Dennis W., to GKN Kwikform Limited. Support assembly. 4,648,484, Cl. 182-222.000.

Lovey, Allen J.: *See*—
Aig, Edward R.; Coffey, John W.; Lovey, Allen J.; and Rosenberger, Michael, 4,648,996, Cl. 260-410.90R.

Lowe, Byron L.: *See*—
Lewis, Robert T.; Sullivan, James W.; Milliner, Kenneth M.; and Lowe, Byron L., 4,648,858, Cl. 493-4.000.

Loy, Jerald M.: *See*—
Grangroth, Robert H.; and Loy, Jerald M., 4,649,339, Cl. 324-158.00F.

Lucas Industries public limited company: *See*—
Hales, Bernard C., 4,648,361, Cl. 123-179.00H.
Yardley, Alfred, 4,648,664, Cl. 303-115.000.

Ludwig, Richard H.: *See*—
Martin, Matthew; and Ludwig, Richard H., 4,648,488, Cl. 187-126.000.

Luke, Mike A., to Baker Oil Tools, Inc. Method and apparatus for steam injection in subterranean wells. 4,648,455, Cl. 166-303.000.

Luke, Roger D.: *See*—
Young, John W.; Luke, Roger D.; Rhodes, Henry J.; and Hudgins, Jeffrey K., 4,649,241, Cl. 200-82.00R.

Lukens General Industries, Inc.: *See*—
Jackson, Keith L., 4,648,326, Cl. 105-168.000.

Lund, Paul D.: *See*—
Walker, Robert L.; Crowe, Dale A.; and Lund, Paul D., 4,649,369, Cl. 340-52.00R.

Lundback, Stig, to Astra-Tech Aktiebolag. Blood pump. 4,648,877, Cl. 623-3.000.

Lunde, George G.; Hoyne, Earl K.; and Nordeen, Charles K., to Minnesota Mining and Manufacturing Company. Electrographic stylus recording apparatus. 4,649,402, Cl. 346-153.100.

Lundgren, Nils L., to Centro-Morgardshammar AB. Method and apparatus for cropping the leading and trailing ends of fast-travelling rolled goods. 4,648,297, Cl. 83-27.000.

Lundgren, Sven-Olov. Automatic container spreader. 4,648,645, Cl. 294-81.530.

Lusk, Kenneth P., to United States of America, Navy. Missile separation system. 4,648,321, Cl. 102-293.000.

Lussow, Robert O.: *See—*
Burgess, Allan C.; Lussow, Robert O.; and Melvin, George E., 4,649,417, Cl. 357-80.000.

Lynch, James E. Water treatment for water injection plasma arc cutting apparatus. 4,649,258, Cl. 219-121.0PY.

Lynch, James P. B. Seat belt tension relief device. 4,648,625, Cl. 280-808.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See—*
Emrich, Helmut; and Wenzel, Jurgen, 4,648,589, Cl. 271-236.000.
Fischer, Hermann, 4,648,318, Cl. 101-415.100.

M. W. Kellogg Company: *See—*
Armstrong, Robert B.; Jongenburger, Huibert S.; and Sadhukhan, Pasupati, 4,648,999, Cl. 261-77.000.

Maa, Jer-shen; and Huang, Sheng M., to RCA Corporation. Formation of submicrometer lines. 4,648,939, Cl. 156-643.000.

Maag Gear-Wheel & Machine Company Limited: *See—*
Sauter, Martin, 4,648,816, Cl. 418-134.000.

MacAvoy, David W.: *See—*
Punako, Stephen; and MacAvoy, David W., 4,648,670, Cl. 339-89.00R.

Macedo, Pedro B.: *See—*
Barkatt, Aaron; and Macedo, Pedro B., 4,648,975, Cl. 210-656.000.

MacGregor, Douglas B.; and Moyer, William C., to Motorola, Inc. Operand size mechanism for control simplification. 4,649,477, Cl. 364-200.000.

Machin, Peter J., to Hoffmann-La Roche Inc. Substituted phenoxy-aminopropanols. 4,649,160, Cl. 514-652.000.

Mack, Thomas E., to PDA Engineering. Radial flow rotor with inserts and turbine utilizing the same. 4,648,802, Cl. 416-244.00A.

Mackey, Lawrence A.: *See—*
Wham, John L.; Mackey, Lawrence A.; and Haselton, Frederick R., 4,648,345, Cl. 114-338.000.

Madison-Kipp Corporation: *See—*
Kayser, John P.; and Kast, Philip J., 4,648,486, Cl. 184-15.100.

Madni, Asad M.; and Wan, Lawrence. Microwave digital phase-shifter apparatus and method for construction. 4,649,553, Cl. 377-43.000.

Maehara, Yoshimi, to Hitachi Maxell, Ltd. Tape cartridge. 4,648,565, Cl. 242-198.000.

Maekawa, Junichi: *See—*
Moriya, Masaichi; Maekawa, Junichi; and Nakamura, Takeshi, 4,648,206, Cl. 49-352.000.

Maget, Henri J. R., to IVAC Corporation. Planar multi-junction electrochemical cell. 4,648,955, Cl. 204-258.000.

Maghenzani, Tersillo, to Pompe F.B.M. S.p.A. Centrifugal pump for very thick and/or viscous materials and products. 4,648,796, Cl. 415-215.000.

Magyar Szenhidrogenipari Kutato-Fejleszto Intezet: *See—*
Baviere, Marc; Moulu, Jean-Claude; Paal, Tibor; Tiszai, Gyorgy; Gaal, Gyorgyi; Schmidt, Laszlo; and Gesztesi, Gyula, 4,648,451, Cl. 166-273.000.

Mahler, James A.; and Munie, Gregory C., to AT&T Technologies, Inc. Method and apparatus for achieving reduced component failure during soldering. 4,648,547, Cl. 228-180.100.

Main, Alan J.: *See—*
von Sprecher, Andreas; Ernest, Ivan; Main, Alan J.; and Beck, Andreas, 4,649,215, Cl. 560-152.000.

Maisch, Wolfgang: *See—*
Gmelin, Karl; Kubach, Hans; Maisch, Wolfgang; Peters, Klaus-Jurgen; and Schelhas, Peter, 4,648,368, Cl. 123-454.000.

Maitland, Peter: *See—*
Tan, Patrick; Maitland, Peter; Kawczynski, Gregory; and Camposeo, Paul V., 4,648,783, Cl. 414-730.000.

Maki, Takao; Murayama, Kenji; and Asahi, Yoshio, to Mitsubishi Chemical Industries Limited. Process for producing oxocarboxylic acids. 4,649,217, Cl. 562-528.000.

Makinen, Ralph W.; and Rickloff, James R., to American Sterilizer Company. Process for the continuous preparation of sterile, depyrogenated solutions. 4,648,978, Cl. 210-759.000.

Makitalo, Valto J.: *See—*
Hultholm, Stig-Erik; Lilja, Launo L.; Makitalo, Valto J.; and Nyman, Bror G., 4,648,973, Cl. 210-629.000.

Makizawa, Yoshiaki: *See—*
Nakagawa, Tohru; Sakurai, Yasuo; and Makizawa, Yoshiaki, 4,648,785, Cl. 414-744.00A.

Malashenko, Alexander; and Stock, Norman A., to Valmet-Dominion Inc. Vibrating forming shoe in a twin wire former. 4,648,943, Cl. 162-300.000.

Malaviya, Shashi D., to International Business Machines Corporation. Fabrication of stud-defined integrated circuit structure. 4,648,173, Cl. 29-576.00W.

Malbrancq, Jean-Michel; and Vantard, Georges, to Rhone-Poulenc S.A. Process/apparatus for the withdrawal/return of body fluids. 4,648,866, Cl. 604-5.000.

Malherbe, Roger F.: *See—*
Ravichandran, Ramanathan; Malherbe, Roger F.; and Seltzer, Raymond, 4,649,221, Cl. 564-300.000.

Mall, Gunther, to Pfaff Industriemaschinen GmbH. Work edge guiding device for sewing machine. 4,648,337, Cl. 112-153.000.

Mallory, Peter E.: *See—*
Halpern, Peter H.; Mallory, Peter E.; Haug, Paul E.; and Koos, William M., Jr., 4,649,549, Cl. 380-32.000.

Mamot, Robert M.: *See—*
Thompson, Kevin D.; Ballard, Gary W.; and Mamot, Robert M., 4,648,551, Cl. 236-49.000.

Manduley, Flavio; and Grisgraber, Edwin G., to Pitney Bowes Inc. Scale with processor controlled power switching. 4,649,490, Cl. 364-466.000.

Manduley, Flavio, to Pitney Bowes Inc. Modular battery powered business systems. 4,649,491, Cl. 364-464.000.

Manjarres, Jesus, to Compania Telefonica Nacional de Espana, S.A. Telecomputer package switching system. 4,649,534, Cl. 370-60.000.

Mann, John P.; Levenstein, Victor M.; and Fox, Charles H., to Dresser Industries, Inc. Method and apparatus for mining machine cutter head. 4,648,660, Cl. 299-10.000.

Mannesmann Aktiengesellschaft: *See—*
Wamser, Karl, 4,648,584, Cl. 266-158.000.

Mannesmann Kienzle GmbH: *See—*
Kelch, Heinz, 4,648,634, Cl. 285-356.000.

Manning, Maurice; and Sawyer, Wilbur H., to Medical College of Ohio; and Columbia University, The Trustees of, a part interest. Novel derivatives of arginine vasopressin antagonists. 4,649,130, Cl. 514-11.000.

Manon, Gerard. Glass element, notably glass block or tile. 4,648,226, Cl. 52-308.000.

Mansmann, Jeffrey G.; and McEntarfer, Philip W., to Motorola Inc. High voltage MOS SCR and power MOSFET "H" switch circuit for a DC motor. 4,649,326, Cl. 318-293.000.

Mansouri, Masoud N.: *See—*
Mansouris, Mansour N.; Mansouri, Masoud N.; and Imani, Kambiz, 4,648,141, Cl. 5-8.000.

Mansouris, Mansour N.; Mansouri, Masoud N.; and Imani, Kambiz. Power operated separable beds and platform. 4,648,141, Cl. 5-8.000.

Manthe, Karl-Heinz: *See—*
Preuss, Bernhard; and Manthe, Karl-Heinz, 4,649,247, Cl. 200-244.000.

Manutair Moller: *See—*
Couarc'h, Michel F. E.; Bessouat, Roger; Lafaye, Marc R. R.; and Bernet, Robert R. E., 4,648,329, Cl. 110-245.000.

Marante, Adilson P.: *See—*
Ladeira, Newton C.; De Oliveria, Paulo R. M.; Marante, Adilson P.; and Krepel, Pedro A., 4,649,033, Cl. 423-242.000.

Marbet, Hans, to Hasler AG Bern. Method for the transmission of characters by means of the code combinations of a telegraph alphabet. 4,649,231, Cl. 178-2.00B.

March, Roger W.: *See—*
Bernstein, David H.; Buckley, Edward M.; March, Roger W.; and Gusowski, Ronald I., deceased, 4,649,470, Cl. 364-200.000.

Marchisi, Giuseppe; and De Martiis, Carlo C., to SGS-ATES Componenti Elettronici S.p.A. Single-in-line integrated electronic component. 4,649,460, Cl. 361-386.000.

Marco Seattle, Inc.: *See—*
Alex, Wayne E.; and Cook, Harold T., Jr., 4,648,193, Cl. 43-4.000.

Mariani, Lauro, to Gilardini S.p.A. Supercharger for supplying a heat engine of a motor vehicle. 4,648,817, Cl. 418-152.000.

Marie, Gerard J. M.: *See—*
Arragon, Jean-Pierre; Cantou, Christian; and Marie, Gerard J. M., 4,649,419, Cl. 380-20.000.

Marinvent Corporation: *See—*
Maris, John M., 4,649,387, Cl. 340-966.000.

Maris, John M., to Marinvent Corporation. Method and apparatus for investigating airflow. 4,649,387, Cl. 340-966.000.

Mark Telephone Products, Inc.: *See—*
Zuckerman, Matthew M., 4,648,260, Cl. 73-23.100.

Marketing Displays, Inc.: *See—*
Seely, James R.; and Hillstrom, David U., 4,648,169, Cl. 29-526.00R.

Marks, Gerald C.; and Quist, Per I., to BP Chemicals Limited. Process for the preparation of phenolic foam. 4,648,922, Cl. 156-79.000.

Marks, Richard L.; and Parker, William T., to AMP Incorporated. Removable retaining and guide means for electrical sockets. 4,648,669, Cl. 339-75.00M.

Maroney, Ralf P. Dice game apparatus. 4,648,602, Cl. 273-146.000.

Marsh, Gary B.; Fanelli, Anthony J.; Armor, John N.; and Zambri, Patrick M., to Allied Corporation. Spray-dried inorganic oxides from non-aqueous gels or solutions. 4,649,037, Cl. 423-338.000.

Marshall, Thomas; and Stupp, Edward H., to North American Philips Corporation. Electrode configurations for an electrophoretic display device. 4,648,956, Cl. 204-299.0EC.

Marsi, Joseph A., to Borg-Warner Corporation. Mechanical seal assembly. 4,648,605, Cl. 277-89.000.

Martin, Anthony N., to United Technologies Corporation. Torque control system. 4,648,797, Cl. 416-27.000.

Martin, David H.; and Spanner, Raymond A., to International Business Machines Corporation. Electrochromic display employing potentiostatic erasure. 4,649,382, Cl. 340-785.000.

Martin, Eugene W.; and Martin, Robert J., to Interwest Import & Export Company. Apparatus and method for a security lock. 4,648,639, Cl. 292-167.000.

Martin, Henry; and Fricker, Urs, to Ciba-Geigy Corporation. Oxime ethers, the preparation thereof, compositions containing them and use thereof. 4,648,895, Cl. 71-88.000.

Martin, Jacob H.: *See—*
Dawson, Thomas F.; Ewing, Paul C., Jr.; Dafnoulelis, Christos V.; and Martin, Jacob H., 4,648,212, Cl. 51-165.00R.

Martin Marietta Corporation: *See*—
George, Ronald W.; Ohmart, James G.; Irlesberger, Kurt H.; Michaud, Lawrence L.; and Engelhaupt, Darell E., 4,648,944, Cl. 204-1.00T.

Martin, Mary S.; McCord, Elizabeth; Puckett, Harley D., Jr.; and Scrutchin, Thomas W., Jr., to International Business Machines Corporation. Apparatus and method for processing system printing data records on a page printer. 4,649,513, Cl. 364-900.000.

Martin, Matthew; and Ludwig, Richard H., to Westinghouse Electric Corp. Elevator system. 4,648,488, Cl. 187-126.000.

Martin, Robert J.: *See*—
Martin, Eugene W.; and Martin, Robert J., 4,648,639, Cl. 292-167.000.

Maruyama, Koji: *See*—
Shibasaki, Sohei; Iwasaki, Yasumasa; Ono, Noriki; Arai, Koichi; Maruyama, Koji; and Shimanari, Tatsumi, 4,648,706, Cl. 355-43.000.

Maruyama, Mitsunori: *See*—
Wada, Shunichi; Shimomura, Setsuhiro; Kumagai, Naotake; Takizawa, Shozo; Maruyama, Mitsunori; Tatemoto, Minoru; Takada, Hiroyuki; and Harara, Mitsuhiko, 4,648,622, Cl. 280-707.000.

Marx, Thomas O.: *See*—
Cox, David C.; and Marx, Thomas O., 4,648,657, Cl. 297-341.000.

Maryanoff, Bruce E., to McNeilab, Inc. Dialkanolamine derivatives. 4,649,204, Cl. 548-541.000.

Maschinen Witte KG: *See*—
Witte, Karl H., 4,649,012, Cl. 264-285.000.

Maschinenfabrik Alfred Schmermund GmbH: *See*—
Oberdorf, Manfred, 4,648,235, Cl. 53-54.000.

Maschinenfabrik Alfred Schmermund GmbH & Co: *See*—
Siegfried, Knecht, 4,648,299, Cl. 83-150.000.

Maschinenfabrik Fr. Niepmann GmbH & Co.: *See*—
Brinker, Alfred; Stewart, Iain G.; and Dreyer, Uwe, 4,648,232, Cl. 53-54.000.

Maschinenfabrik Muller-Weingarten AG: *See*—
Harsch, Erich; and Reichenbach, Reiner, 4,648,736, Cl. 403-297.000.

Maschinenfabrik Rieter A.G.: *See*—
Staheli, Paul; Stahli, Urs; and Knabenhaus, Fritz, 4,648,754, Cl. 406-156.000.

Masovich, Felix Z.; and Starichnev, Vladimir V., to Gosudarstvenny Proektno-Konstruktorsky I Experimentalny Institut Ugolnogo Mashinostroenia "Giprouglemash" . Method and hydraulic system for controlling supply of fluid to combine for extracting minerals. 4,648,659, Cl. 299-1.000.

Massachusetts Institute of Technology: *See*—
Kittrell, Carter; Hayes, Gary B.; and Feld, Michael S., 4,648,892, Cl. 65-4.210.
Sinskey, Anthony J.; Walker, Graham C.; Higashio, Kanji; Rao, Eswara A.; Shanabruch, William G.; and Yoshihama, Makoto, 4,649,119, Cl. 435-317.000.
Veldkamp, Wilfrid B.; Leger, James R.; and Swanson, Gary J., 4,649,351, Cl. 330-4.300.
Wurtman, Richard J.; Wurtman, Judith J.; and O'Rourke, Dermot, 4,649,161, Cl. 514-654.000.

Masuda, Mitsuhiro; Igarashi, Osamu; Tokuyama, Keiichi; and Katogi, Kozo, to Hitachi, Ltd. Liquid crystal panel display device. 4,649,381, Cl. 340-784.000.

Masuda, Yukihiro: *See*—
Kodama, Takuma; Takahashi, Kenji; Ishibashi, Shizuka; Kudo, Koji; Masuda, Yukihiro; Hombough, Masanori; Miyoshi, Osamu; and Yoshiwara, Kazuhisa, 4,649,421, Cl. 358-51.000.

Masumori, Hideo: *See*—
Takeuchi, Yukihisa; and Masumori, Hideo, 4,649,125, Cl. 501-15.000.

Masuoka, Fujio: *See*—
Iwase, Taira; Ariizumi, Shoji; and Masuoka, Fujio, 4,649,412, Cl. 357-41.000.

Matick, Richard E.: *See*—
Chung, Paul W.; Matick, Richard E.; and Ling, Daniel T., 4,649,516, Cl. 364-900.000.

Matsubayashi, Takayuki, to Tokyo Shibaura Denki Kabushiki Kaisha. X-ray computerized tomographic apparatus. 4,649,555, Cl. 378-4.000.

Matsui, Kazuhiro: *See*—
Hoshino, Yoshiki; and Matsui, Kazuhiro, 4,648,304, Cl. 84-313.000.

Matsui, Minoru; and Tsuno, Nobuo, to NGK Insulators, Ltd. Internal combustion engine piston and a method of producing the same. 4,648,308, Cl. 92-212.000.

Matsui, Tetsu, to Tokai Rubber Industries, Ltd. Mounting structure for power unit. 4,648,576, Cl. 248-550.000.

Matsumoto, Ikuo: *See*—
Nakamura, Takeshi; Matsumoto, Ikuo; and Ando, Kenji, 4,649,310, Cl. 310-321.000.

Matsumoto, Jun-ichi; Miyamoto, Teruyuki; Uno, Hitoshi; and Nakamura, Shinichi, to Dainippon Pharmaceutical Co., Ltd. Antibacterial 7-(3-amino-1-pyrrolidinyl)-1-cyclopropyl-6-fluoro-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid derivatives. 4,649,144, Cl. 514-300.000.

Matsumoto, Katsumi: *See*—
Kunii, Hideo; and Matsumoto, Katsumi, 4,649,442, Cl. 360-72.200.

Matsumoto, Kenji: *See*—
Miyata, Toshimi; Takahashi, Toshiki; and Matsumoto, Kenji, 4,648,222, Cl. 52-208.000.

Matsumoto, Masahiro: *See*—
Yamaguchi, Hiroshi; Tanaka, Teruaki; Hirai, Masatake; Kohketsu, Tadashi; Matsumoto, Masahiro; and Kawate, Kenji, 4,649,248, Cl. 219-10.570.

Matsunaga, Kenichi: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,649,133, Cl. 514-42.000.

Matsunaga, Yasuyuki, to Bando Kagaku Kabushiki Kaisha. Endless belt with tension cords and method of making such a belt. 4,648,856, Cl. 474-237.000.

Matsuo, Junichi: *See*—
Nohara, Shigezo; Sugimoto, Takeshi; Sakaao, Kozaburo; Ohkubo, Yoshimichi; and Matsuo, Junichi, 4,649,004, Cl. 264-85.000.

Matsushita Electric Industrial Company, Ltd.: *See*—
Ibata, Akihiko; and Sakamoto, Yoichi, 4,648,915, Cl. 148-101.000.
Nakagawa, Tohru; Sakurai, Yasuo; and Makizawa, Yoshiaki, 4,648,785, Cl. 414-744.00A.

Matsushita Electric Works, Ltd.: *See*—
Yukawa, Kazuhiko, 4,649,552, Cl. 377-24.000.

Matsushita, Toshiro: *See*—
Kuwano, Hiroaki; Matsushita, Toshiro; Kakuma, Hideaki; and Motomiya, Teruaki, 4,648,580, Cl. 251-129.010.

Matsuta, Shigetoshi, to Alps Electric Co., Ltd. Grounding construction for multilayer printed circuit boards. 4,649,461, Cl. 361-415.000.

Mattei, Riccardo, to G.D Societa per Azioni. Paper web feed device in a cigarette production machine. 4,648,409, Cl. 131-60.000.

Mattis, John S.; Berth, Jorgen; and Locke, Gilbert E., to Raychem Corporation. Secure connector for coaxial cable. 4,648,684, Cl. 339-177.00R.

Mattson, Philip D. Surgical instrument for severing an umbilical cord. 4,648,401, Cl. 128-305.000.

Matyas, Bela; Gerber, Pal; Solymos, Andras; Kaszanitzky, Ferenc; Panto, Gyorgy; and Leffler, Janos, to Tatabanyai Szen banyak. Process for recovering rare metals from the combustion residue of coal by digestion. 4,649,031, Cl. 423-20.000.

Matyas, Stephen M.: *See*—
Bass, Walter E.; Matyas, Stephen M.; and Oseas, Jonathan, 4,649,233, Cl. 380-21.000.

Maudal, Inge; and Moss, John F., to General Dynamics, Pomona Division. Directional control of rockets using elastic deformation of structural members. 4,648,567, Cl. 244-3.240.

Max Kahn Curtain Corporation: *See*—
Rusconi, John B.; and Cole, Ronald A., 4,648,338, Cl. 112-180.000.

Maxon Industries, Inc.: *See*—
Verner, Michael L., 4,648,775, Cl. 414-513.000.

May, David C., to Minnesota Mining and Manufacturing Company. Pavement marking tape. 4,648,689, Cl. 350-105.000.

Maya, Jakob, to GTE Products Corporation. Photoionization technique to enrich mercury isotopes and apparatus therefor. 4,648,951, Cl. 204-157.210.

Mayer, Hans-Michael, to Elektrowatt AG. Electro-hydraulic actuator or positioning drive for continuous control or regulation operations. 4,648,245, Cl. 60-477.000.

Mayer, Udo: *See*—
Colberg, Horst; and Mayer, Udo, 4,648,993, Cl. 540-134.000.

Mayhew, Harry W.: *See*—
Rekers, Louis J.; Speca, Anthony N.; and Mayhew, Harry W., 4,649,128, Cl. 502-109.000.

Mayo, Howard A., Jr.; and Whippen, Warren G., to Voith Hydro, Inc. Inclined reaction turbine with vortex suppression. 4,648,244, Cl. 60-398.000.

Mazzorana, Alfred B.; and Froment, Francis, to Societe Paris-Rhone. Electric starter incorporating a base plate supporting the carcase of its electric motor and the yoke of its contactor. 4,649,285, Cl. 290-48.000.

McCauley, Lewis D., to McGard, Inc. Locknut and key therefor. 4,648,293, Cl. 81-436.000.

McCord, Elizabeth: *See*—
Martin, Mary S.; McCord, Elizabeth; Puckett, Harley D., Jr.; and Scrutchin, Thomas W., Jr., 4,649,513, Cl. 364-900.000.

McCormick, Charles L.; and Blackmon, Kenneth P., to University of Southern Mississippi. Calcium-tolerant N-substituted acrylamides as thickeners for aqueous systems. 4,649,183, Cl. 526-240.000.

McCormick, Malcolm: *See*—
Naismith, John A.; McCormick, Malcolm; Howe, David; and Pate, Malcolm A., 4,648,947, Cl. 204-51.000.

McCrary, Avis L.: *See*—
Bertram, James L.; Walker, Louis L.; McCrary, Avis L.; and Cortez, Fermin M., 4,649,188, Cl. 528-165.000.

McCulloch, Alister L., to Chubb Australia Limited. Fire protection system. 4,648,460, Cl. 169-57.000.

McDermott, Brian K., to Olin Corporation. Projectile with enhanced target penetrating power. 4,648,324, Cl. 102-518.000.

McDonald, Gerald H., to Resistance Technology, Inc. Trimmer control mounted in potentiometer knob. 4,649,366, Cl. 338-134.000.

McDonald, Samuel G.: *See*—
Sabol, George P.; McDonald, Samuel G.; and Nurminen, John I., 4,648,912, Cl. 148-11.50F.

McDonald, Samuel G., III: *See*—
Sabol, George P.; and McDonald, Samuel G., III, 4,649,023, Cl. 420-422.000.

McElroy, James F., to United Technologies Corporation. Fuel cell battery with improved membrane cooling. 4,649,091, Cl. 429-34.000.

McEntarfer, Philip W.: *See*—
Mansmann, Jeffrey G.; and McEntarfer, Philip W., 4,649,326, Cl. 318-293.000.

McEntee, Thomas C.; Guilbault, Lawrence J.; Brophy, James F.; and Koob, Judith L., to Morton Thiokol, Inc. Antimicrobials impregnated into fibers. 4,649,078, Cl. 428-375.000.

McEntee, Thomas C.: *See*—
Guilbault, Lawrence J.; McEntee, Thomas C.; Koob, Judith L.; and Brophy, James F., 4,649,079, Cl. 428-375.000.

McGard, Inc.: *See*—
McCauley, Lewis D., 4,648,293, Cl. 81-436.000.

McGrath, John E. Balloon clip stapler device. 4,648,178, Cl. 29-811.000.

McGregor, Robert E.; and Hubbard, Thomas J., to Phillips Petroleum Company. Data acquisition. 4,649,386, Cl. 340-370.240.

McGrew, Bernard L.: *See*—
Duppong, Denis E.; McGrew, Bernard L.; and Decker, Ramsay P., 4,649,375, Cl. 340-660.000.

McKinnon, Gordon M.: *See*—
Krouglicof, Nicholas; McKinnon, Gordon M.; and Svoboda, Jaroslav, 4,649,504, Cl. 364-559.000.

McKnight, Roy S. Sliding door lock assembly. 4,648,638, Cl. 292-144.000.

McLaughlin, Kevin L., to Motorola, Inc. BIMOS logic gate. 4,649,294, Cl. 307-446.000.

McLaughlin, Kevin L.; and Seelbach, Walter C., to Motorola, Inc. BIMOS logic gate. 4,649,295, Cl. 307-446.000.

McLaurin, Leroy D.: *See*—
Brown, David L.; and McLaurin, Leroy D., 4,648,799, Cl. 416-95.000.

McMath, Henry G., Jr., to Exxon Research and Engineering Company. Retorting with sintered or fused solids. 4,648,965, Cl. 208-411.000.

McNeilab, Inc.: *See*—
Maryanoff, Bruce E., 4,649,204, Cl. 548-541.000.

McQueen, Phillip J., to Acme Plastics, Inc., a part interest. Impact and vibration attenuating pad with offset dimples. 4,648,554, Cl. 238-283.000.

McSherry, Charles K.: *See*—
Mosbach, Erwin H.; McSherry, Charles K.; and Kuroki, Syoji, 4,648,995, Cl. 260-397.100.

Mead Corporation, The: *See*—
Holycross, Mark; Saccocio, Edward J.; and Proehl, Scott, 4,648,699, Cl. 354-297.000.

Meadows, Roger D.; Rush, James B.; and Bryan, James S., to Dayco Products, Inc. Branched hose construction, T-connector therefor and methods of making the same. 4,648,628, Cl. 285-24.000.

Mechalas, Emmanuel. Vacuum apparatus for filling bags with particulate material including dust collector and recycling of collected material. 4,648,432, Cl. 141-68.000.

Medica Corporation: *See*—
Kaltenbach, Karl W.; Rettew, Stephen; Rudy, John O.; and Szakacs, Gabor L., 4,649,028, Cl. 422-100.000.

Medical College of Ohio: *See*—
Manning, Maurice; and Sawyer, Wilbur H., 4,649,130, Cl. 514-11.000.

Mediplast AB: *See*—
Jacob, Peter, 4,648,871, Cl. 604-149.000.

Medscan B.V.: *See*—
Hutcheson, David W.; Van Der Molen, Engelbertus J.; and Oly, Pieter J., 4,648,408, Cl. 128-770.000.

Meiji Seika Kaisha, Ltd.: *See*—
Sumi, Naoki; Yamashita, Hiroshi; and Sekizuka, Yasuo, 4,649,052, Cl. 426-49.000.

Meinen, Georg H. Portioning device. 4,648,154, Cl. 17-35.000.

Meininger, Fritz; Otten, Joachim W., deceased; by Otten, Ursula, heir; and by Rudolph nee Otten, Anna G., heir, to Hoechst Aktiengesellschaft. Water-soluble dyestuffs containing fibre-reactive groups of the vinylsulfone series and the fluoro-s-triazinyl-amino series. 4,649,193, Cl. 534-622.000.

Melis, Florentinus; Verbergt, Jan; and Van Rooy, Willy, to Coal-O-Matic PVBA. Lighter for stove, open hearth and similar. 4,649,260, Cl. 219-267.000.

Melles Griot, San Marcos Company: *See*—
Lee, Wei-long W.; Dorich, Michael J.; and Eerkens, Jeff W., 4,649,545, Cl. 372-61.000.

Melvin, George E.: *See*—
Burgess, Allan C.; Lussow, Robert O.; and Melvin, George E., 4,649,417, Cl. 357-80.000.

Melzi, Carlo; and Gregorutti, Paolo, to Acciaierie Weissenfels S.p.A. Antiskid device for motor vehicle tires. 4,648,434, Cl. 152-213.00A.

Memorial Management and Marketing Concepts, Inc.: *See*—
Johnston, Franklin R., Sr., 4,648,219, Cl. 52-131.000.

Mendes, Luiz N.: *See*—
Nolf, Jean-Marie E.; Genbrugge, Hubert; Buekers, Valere; Mendes, Luiz N.; Doucet, Jos; and Vansant, Jan, 4,648,168, Cl. 29-447.000.

Menigaux, Louis; and Sansonetti, Pierre. Process for manufacturing a semiconductor laser having a buried ribbon. 4,648,940, Cl. 156-649.000.

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Thiel, Klaus P.; Sindlinger, Raimund; and Merrem, Hans J., 4,649,101, Cl. 430-326.000.

Mereness, William M.: *See*—
Fox, William D.; and Mereness, William M., 4,648,542, Cl. 227-19.000.

Merkt, Robert. Device for producing an installation template for conduits, especially conduits for hydraulic or pneumatic control or process circuits. 4,648,733, Cl. 403-56.000.

Merlin Gerin: *See*—
Baginski, Pierre; and Nebon, Jean-Pierre, 4,649,244, Cl. 200-153.08SC.

Merrem, Hans J.: *See*—
Thiel, Klaus P.; Sindlinger, Raimund; and Merrem, Hans J., 4,649,101, Cl. 430-326.000.

Merritt, Vernon L. Looseleaf binder holder. 4,648,515, Cl. 211-43.000.

Meshbesher, Thomas M. Electrogenerative oxidation of lower alcohols to useful products. 4,648,948, Cl. 204-79.000.

Metalines, Inc.: *See*—
Dunsworth, Charles L., 4,649,129, Cl. 502-407.000.

Methods, Inc.: *See*—
Dorumsgaard, John A.; and Amerson, Roger H., 4,648,774, Cl. 414-416.000.

Metz, Werner A., Jr.; Szluk, Nicholas J.; Miller, Gayle W.; Drury, Michael J.; and Sullivan, Paul A., to NCR Corporation. Use of selectively deposited tungsten for contact formation and shunting metallization. 4,648,175, Cl. 29-589.000.

Meyer, Willy: *See*—
Gass, Karl; Fory, Werner; Meyer, Willy; and Topfl, Werner, 4,648,899, Cl. 71-93.000.

Meyman, Usher. Automatic transmission. 4,648,477, Cl. 180-308.000.

Meyn, Pieter. Method and apparatus for removing the breast flesh from a poultry carcass. 4,648,156, Cl. 17-46.000.

Miceli, Philip V. Folding pocket tool and knife. 4,648,145, Cl. 7-158.000.

Michael, Jeffrey D.: *See*—
Ross, Barry C.; and Michael, Jeffrey D., 4,649,145, Cl. 514-370.000.

Michalik, Horst B., to Koenig & Bauer Aktiengesellschaft. Gear folder. 4,648,586, Cl. 270-50.000.

Michaud, Jocelyn P.; and Brennan, Leonard A. Fuel pre-heater. 4,648,372, Cl. 123-557.000.

Michaud, Lawrence L.: *See*—
George, Ronald W.; Ohmart, James G.; Irlesberger, Kurt H.; Michaud, Lawrence L.; and Engelhaupt, Darell E., 4,648,944, Cl. 204-1.00T.

Michel, Thomas J., to Data Medi-Card, Inc. Laminated medical data card. 4,648,189, Cl. 40-546.000.

Micheron, Francois: *See*—
Robin, Philippe; Micheron, Francois; Petit, Patrick; and Broussoux, Dominique, 4,649,312, Cl. 310-330.000.

Mickelson, Eric N.: *See*—
Scruggs, David M.; and Mickelson, Eric N., 4,648,820, Cl. 425-8.000.

Midori C.M.B. Co., Ltd.: *See*—
Tochikawa, Kiyoshi, 4,649,014, Cl. 264-555.000.

Midwest Green Products, Inc.: *See*—
Larson, Conrad M., 4,648,349, Cl. 119-1.000.

Mieyal, David F.; Shirey, Richard; and Worley, Robert F., to Donn Incorporated. Locking connection with suspension ceiling grid systems. 4,648,230, Cl. 52-667.000.

Mikulan, Willy E. Universally-movable machine part and fluid transfer apparatus utilizing same. 4,648,813, Cl. 418-49.000.

Miles Laboratories, Inc.: *See*—
Charlton, Steven C.; Hemmes, Paul; and Lau, Arthur L. Y., 4,649,123, Cl. 436-79.000.
Ismail, Ibrahim A.; Hemmes, Paul; Skarstedt, Mark T.; and Zipp, Adam, 4,649,121, Cl. 436-14.000.

Milkowski, Wolfgang: *See*—
Zeugner, Horst; Romer, Dietmar; Liepmann, Hans; and Milkowski, Wolfgang, 4,649,137, Cl. 514-221.000.

Miller, Alan L.: *See*—
Petzold, Werner P.; and Miller, Alan L., 4,648,496, Cl. 192-0.076.

Miller, Alistair A.: *See*—
Allan, Geoffrey; Miller, Alistair A.; and Sawyer, David A., 4,649,139, Cl. 514-242.000.

Miller, Daniel R.; Daniels, Timothy R.; and Deaton, Thomas P., to Buckhorn Material Handling Group Inc. Crustacean trap. 4,648,200, Cl. 43-102.000.

Miller, Edward H., to General Electric Company. Turbine wheel key and keyway ventilation. 4,648,793, Cl. 415-168.000.

Miller, Gayle W.: *See*—
Metz, Werner A., Jr.; Szluk, Nicholas J.; Miller, Gayle W.; Drury, Michael J.; and Sullivan, Paul A., 4,648,175, Cl. 29-589.000.

Miller, Gordon G.: *See*—
Fradenburgh, Evan A.; Kiely, Edmond F.; and Miller, Gordon G., 4,648,800, Cl. 416-134.00A.

Miller, Homer W.: *See*—
Crain, Steven L.; and Miller, Homer W., 4,649,539, Cl. 371-25.000.

Miller, Michael F.: *See*—
Carlson, Lee R.; Hegedus, Denes A.; Jarrett, Steven M.; Miller, Michael F.; Riley, Martin E.; and Wright, David L., 4,649,547, Cl. 372-61.000.

Miller, William, to Ebert, Michael. Physiological pressure measuring system. 4,648,406, Cl. 128-674.000.

Milliner, Kenneth M.: *See*—
Lewis, Robert T.; Sullivan, James W.; Milliner, Kenneth M.; and Lowe, Byron L., 4,648,858, Cl. 493-4.000.

Millipore Corporation: *See*—
Carson, William W., 4,648,285, Cl. 74-424.80C.

Milach, Ulrich; and Pohlig, Wolf-Dieter, to Bopp & Reuther GmbH. Method of and device for measuring flow rate by electromagnetic induction. 4,648,279, Cl. 73-861.170.

Miltenburger, Herbert G.; and Hessberg, Sigfried, to Intermedicat GmbH. Oxygen permeable membrane in fermenter for oxygen enrichment of broth. 4,649,114, Cl. 435-240.000.
Milwaukee Electric Tool Corporation: *See*—
Itzov, Andrew L., 4,648,758, Cl. 408-136.000.
Minamida, Katsuhiro; Takafuji, Hideo; Haga, Hiroya; and Mizuhashi, Nobuo, to Nippon Steel Corporation. High-frequency electric resistance welding method using irradiation with a laser beam. 4,649,256, Cl. 219-121.0LD.
Mine Safety Appliances Company: *See*—
Wise, Layton A., 4,648,394, Cl. 128-201.240.
Minear, Ronald J.: *See*—
Terbrack, William H.; Brion, Harvey F.; and Minear, Ronald J., 4,649,570, Cl. 455-344.000.
Minker, Manfred; and Rohling, Hermann, to Licentia Patent-Verwaltungs-GmbH. Method of and a device for recognizing targets and suppressing spurious signals in radar equipment. 4,649,394, Cl. 342-94.000.
Minnesota Mining and Manufacturing Company: *See*—
Bailey, Terry R., 4,648,932, Cl. 156-276.000.
Lunde, George G.; Hoyne, Earl K.; and Nordeen, Charles K., 4,649,402, Cl. 346-153.100.
May, David C., 4,648,689, Cl. 350-105.000.
Mitra, Sumita B., 4,648,843, Cl. 433-201.100.
Mongeon, Douglas R., 4,648,541, Cl. 227-19.000.
Niles, Gerald J., 4,648,514, Cl. 211-41.000.
Thielen, James E., 4,648,738, Cl. 403-341.000.
Tollefson, Dale T., 4,648,563, Cl. 242-76.000.
Mintchev, Mintcho S.: *See*—
Savov, Svetoslav A.; Mintchev, Mintcho S.; Nitchev, Peter T.; and Shivarov, Georgi S., 4,648,952, Cl. 204-192.120.
Mitani, Nobuhiro: *See*—
Kitamura, Yuji; and Mitani, Nobuhiro, 4,649,407, Cl. 357-24.000.
Mitchell, Robert N.; and Hunt, James L., to Kennematel, Inc. Machining method. 4,648,761, Cl. 29-558.000.
Mitchell, Wayne A.: *See*—
Hwa, Chih M.; and Mitchell, Wayne A., 4,649,025, Cl. 422-15.000.
Mitra, Sumita B., to Minnesota Mining and Manufacturing Company. Method of dental treatment using poly(ethylenically unsaturated) carbamoyl isocyanurates and dental materials made therewith. 4,648,843, Cl. 433-201.100.
Mitsubishi Chemical Industries Limited: *See*—
Maki, Takao; Murayama, Kenji; and Asahi, Yoshio, 4,649,217, Cl. 562-528.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Fujikawa, Katsuhiro, 4,648,339, Cl. 112-277.000.
Hirao, Toshiki, 4,649,303, Cl. 310-52.000.
Kinoshita, Tsuyoshi, 4,648,692, Cl. 350-632.000.
Mitsui, Kotaro; Kato, Mari; Oda, Takao; and Yoshida, Susumu, 4,649,088, Cl. 428-697.000.
Wada, Shunichi; Shimomura, Setsuhiro; Kumagai, Naotake; Takizawa, Shozo; Maruyama, Mitsunori; Tatemoto, Minoru; Takada, Hiroyuki; and Harara, Mitsuhiko, 4,648,622, Cl. 280-707.000.
Wakamiya, Yoshinori, 4,648,256, Cl. 72-8.000.
Yamamoto, Makoto, 4,649,290, Cl. 307-260.000.
Yoda, Kiyoshi; Itagaki, Hidenobu; Fujimura, Satoshi; and Yamada, Tadatoshi, 4,649,345, Cl. 324-309.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Wada, Shunichi; Shimomura, Setsuhiro; Kumagai, Naotake; Takizawa, Shozo; Maruyama, Mitsunori; Tatemoto, Minoru; Takada, Hiroyuki; and Harara, Mitsuhiko, 4,648,622, Cl. 280-707.000.
Mitsubishi Paper Mills, Ltd.: *See*—
Tsubai, Yasuo; Okazaki, Koji; Horii, Shoichi; and Yoshida, Akio, 4,649,096, Cl. 430-249.000.
Tsukada, Satoshi; and Taguchi, Kazuhisa, 4,649,097, Cl. 430-270.000.
Mitsubishi Plastics Industries, Limited: *See*—
Shibata, Kizo; and Dodo, Kazuo, 4,649,009, Cl. 264-235.800.
Mitsubishi Rayon Company, Ltd.: *See*—
Ohe, Makoto, 4,648,690, Cl. 350-321.000.
Mitsui, Kotaro; Kato, Mari; Oda, Takao; and Yoshida, Susumu, to Mitsubishi Denki Kabushiki Kaisha. Antireflective film for photoelectric devices. 4,649,088, Cl. 428-697.000.
Mitsui Toatsu Chemicals, Incorporated: *See*—
Itoh, Hiroshi; Nitta, Atsuhiko; Tanaka, Tomio; and Kamio, Hideo, 4,649,219, Cl. 564-207.000.
Mitsuta, Yuji: *See*—
Ban, Itsuki; Kii, Toshiyuki; and Mitsuta, Yuji, 4,648,710, Cl. 356-4.000.
Mitutoyo Mfg. Co., Ltd.: *See*—
Sadamitsu, Nishihara; and Yuji, Kawahara, 4,648,718, Cl. 356-387.000.
Miura, Kunihiko, to Kabushiki Kaisha Toshiba. Recording apparatus. 4,649,403, Cl. 346-160.000.
Miwa, Hirohide: *See*—
Klepper, John R.; Reid, John M.; Miwa, Hirohide; Shimura, Takaki; and Murakami, Keiichi, 4,648,276, Cl. 73-599.000.
Miyamoto, Teruyuki: *See*—
Matsumoto, Jun-ichi; Miyamoto, Teruyuki; Uno, Hitoshi; and Nakamura, Shinichi, 4,649,144, Cl. 514-300.000.
Miyata, Hiroshi: *See*—
Yokoya, Yuji; Buma, Shuuichi; Araki, Hitoshi; Miyata, Hiroshi; Hirose, Masanori; and Ohashi, Kaoru, 4,648,621, Cl. 280-707.000.
Miyata, Toshimi; Takahashi, Toshiki; and Matsumoto, Kenji, to Honda Giken Kogyo Kabushiki Kaisha. Mount structure of a windowpane for automobile use. 4,648,222, Cl. 52-208.000.
Miyazaki, Katsuto: *See*—
Ohki, Masaru; Hirosawa, Toshio; Kurihara, Junichi; and Miyazaki, Katsuto, 4,649,480, Cl. 364-300.000.
Miyazawa, Hideo; Endo, Shokichi; and Nishimoto, Hideo, to Hitachi, Ltd. Pallet for use in production of color cathode ray tube. 4,648,346, Cl. 118-500.000.
Miyoshi, Noriomi; Tsuruoka, Michihiko; and Nagumo, Mutsumi, to Fuji Electric Co., Ltd. Karman vortex flowmeter. 4,648,280, Cl. 73-861.240.
Miyoshi, Osamu: *See*—
Kodama, Takuma; Takahashi, Kenji; Ishibashi, Shizuka; Kudo, Koji; Masuda, Yukihiro; Hombough, Masanori; Miyoshi, Osamu; and Yoshiwara, Kazuhira, 4,649,421, Cl. 358-51.000.
Mizuhashi, Nobuo: *See*—
Minamida, Katsuhiro; Takafuji, Hideo; Haga, Hiroya; and Mizuhashi, Nobuo, 4,649,256, Cl. 219-121.0LD.
Mizuno, Chiaki: *See*—
Ogawa, Hiroshi; Saito, Shinji; Mizuno, Chiaki; and Tamai, Yasuo, 4,649,081, Cl. 428-447.000.
Mizutani, Norio; and Kasai, Toshiyuki, to Nippon Kogaku K.K. Illumination apparatus for testing photoelectric transducer device. 4,648,695, Cl. 353-28.000.
Mobil Oil Corporation: *See*—
Angona, Frank A.; and Zemanek, Joseph, Jr., 4,649,525, Cl. 367-31.000.
Degnan, Thomas F., Jr.; and Chen, Nai Y., 4,649,127, Cl. 502-33.000.
Dixon, James R., Jr., 4,649,483, Cl. 364-422.000.
Graziani, Kenneth R.; and Kyan, Chwan P., 4,648,957, Cl. 208-58.000.
Snavely, Earl S., Jr.; and Jones, Timothy A., 4,649,032, Cl. 423-226.000.
Mock, Elmar; and Muller, Jacques, to ETA S.A., Fabriques d'Ebauches. Plastic watch casing with plastic crystal and process for joining the crystal to the casing. 4,648,722, Cl. 368-294.000.
Moen, Ingar: *See*—
Nilsen, Gunnar; Wang, Erik; and Moen, Ingar, 4,649,237, Cl. 200-15.000.
Mohri, Kunihiko: *See*—
Takasuka, Yutaka; Mohri, Kunihiko; and Kawaguchi, Akiko, 4,648,908, Cl. 106-308.00F.
Molee, Kenneth J.: *See*—
Becker, Patricia E.; and Molee, Kenneth J., 4,648,876, Cl. 604-370.000.
Moll, Helmut; and Ritchie, Roger E., to Scientific Drilling International. Test circuit for detector used in well bore. 4,649,344, Cl. 324-221.000.
Moller, Werner G.: *See*—
Brunig, Matthias A. M.; and Moller, Werner G., 4,648,787, Cl. 415-72.000.
Mollers Maschinenfabrik GmbH: *See*—
Klupfel, Olaf; Frielinghaus, Walter S.; and Scholz, Erhard, 4,648,646, Cl. 294-106.000.
Molnlycke AB: *See*—
Jungnell, Jarl O.; and Skold, Bo P., 4,648,619, Cl. 280-650.000.
Monarch Marking Systems, Inc.: *See*—
Heaton, Richard D.; and Linton, Steven C., 4,649,397, Cl. 343-895.000.
Mongeon, Douglas R., to Minnesota Mining and Manufacturing Company. Bone stapler. 4,648,541, Cl. 227-19.000.
Monnier, Charles E.: *See*—
Darms, Roland; and Monnier, Charles E., 4,649,181, Cl. 525-524.000.
Monreal, F. Javier. Knee bindings compatible with ordinary water skis. 4,648,849, Cl. 441-70.000.
Montedison S.p.A.: *See*—
Pastorello, Fabio; and Troglia, Claudio, 4,649,036, Cl. 423-328.000.
Moody, Dale M. Protected hand grip assembly for anglers. 4,648,196, Cl. 43-23.000.
Mooney Chemicals, Inc.: *See*—
Hein, Richard W.; and Kelso, William C., 4,649,065, Cl. 427-370.000.
Moore, Derek V., to Levitt-Safety Limited. Two terminal nicad battery charger with battery voltage and temperature sensing. 4,649,333, Cl. 320-31.000.
Moore, Thomas S., to Ford Motor Company. Mechanism to engage part time drive system in a moving vehicle. 4,648,492, Cl. 192-3.210.
Moorhouse, David, to jmh Holdings Limited. Vehicle seats. 4,648,655, Cl. 297-331.000.
Moraitis, Dennis: *See*—
Andrews, LaVern A.; and Moraitis, Dennis, 4,649,390, Cl. 342-140.000.
Mordant, Ludo H. J., to U.S. Philips Corporation. Magnetic-tape-cassette apparatus with impulse reset to the rest position. 4,649,440, Cl. 360-69.000.
Mori, Masaaki: *See*—
Yoshida, Taizo; Mori, Masaaki; Koyama, Jiro; and Haruna, Masamitsu, 4,648,687, Cl. 350-96.130.
Morikawa, Hideyuki: *See*—
Kobayashi, Susumu; and Morikawa, Hideyuki, 4,648,812, Cl. 417-477.000.

Moriki, Yoshikazu: *See—*
Ogasawara, Masafumi; Yamaguchi, Nobu; and Moriki, Yoshikazu, 4,648,826, Cl. 425-192.00S.
Morimoto, Chikao: *See—*
Schlossman, Stuart F.; and Morimoto, Chikao, 4,649,106, Cl. 435-7.000.
Morimoto, Makoto: *See—*
Ishii, Shinzo; Katsumata, Shigeo; Arai, Yukou; Fujimoto, Kazuhisa; and Morimoto, Makoto, 4,649,199, Cl. 544-342.000.
Morimune, Katuhiko: *See—*
Sekine, Hirokazu; Morimune, Katuhiko; Watanabe, Masaharu; and Suzuki, Nobuo, 4,649,408, Cl. 357-24.000.
Morishita, Takuya; Kurioka, Akihiko; and Morita, Akihiro, to Sanyo Electric Co., Ltd. Vacuum cleaner. 4,648,150, Cl. 15-389.000.
Morita, Akihiro: *See—*
Morishita, Takuya; Kurioka, Akihiko; and Morita, Akihiro, 4,648,150, Cl. 15-389.000.
Morita, Koichi: *See—*
Hayase, Yoshio; Morita, Koichi; Ide, Kinya; and Takahashi, Toshio, 4,648,898, Cl. 71-93.000.
Morita, Masahiko; and Hashimoto, Osamu, to Kawasaki Steel Corporation. Method of controlling cooling of hot-rolled steel sheet and system therefor. 4,648,916, Cl. 148-128.000.
Morita, Yutaka; Katayama, Masayoshi; and Kato, Takashi, to Osaka Gas Co., Ltd.; and Tokico Ltd. Turbine flowmeter. 4,648,281, Cl. 73-861.910.
Moriya, Kozo: *See—*
Sato, Toru; and Moriya, Kozo, 4,648,395, Cl. 128-204.230.
Moriya, Masaichi; Maekawa, Junichi; and Nakamura, Takeshi, to Ohi Seisakusho Co., Ltd. Window glass raising and lowering apparatus. 4,648,206, Cl. 49-352.000.
Moriya, Mitutoshi: *See—*
Ota, Kazuomi; Kato, Minoru; Narita, Seiichi; and Moriya, Mitutoshi, 4,649,282, Cl. 250-574.000.
Morrill, Wayne J. Capacitor between motor windings. 4,649,305, Cl. 310-72.000.
Morrison, Kenneth G.: *See—*
Peterson, Weldon H.; and Morrison, Kenneth G., 4,648,830, Cl. 425-464.000.
Morritt, Graham N.; Paes, Malvolio L.; Conacher, Ian D.; Gutridge, John R.; and Snellgrove, Timothy R. Laser bronchoscope ventilator. 4,648,386, Cl. 128-4.000.
Morrow, Stanley J.: *See—*
Hensiee, Walter W.; Morrow, Stanley J.; and Lindsey, John S., 4,648,954, Cl. 204-243.00R.
Morton Thiokol Inc.: *See—*
Guilbault, Lawrence J.; McEntee, Thomas C.; Koob, Judith L.; and Brophy, James F., 4,649,079, Cl. 428-375.000.
McEntee, Thomas C.; Guilbault, Lawrence J.; Brophy, James F.; and Koob, Judith L., 4,649,078, Cl. 428-375.000.
Mosbach, Erwin H.; McSherry, Charles K.; and Kuroki, Syoji, to Beth Israel Medical Center. Chemical synthesis. 4,648,995, Cl. 260-397.100.
Moser, Keith W., to Industra Products, Inc. Method and apparatus for positioning and transferring stator coil leads. 4,648,176, Cl. 29-596.000.
Moss, John F.: *See—*
Maudal, Inge; and Moss, John F., 4,648,567, Cl. 244-3.240.
Mosse, Richard W. E.: *See—*
Chant, Nigel A.; Mosse, Richard W. E.; and Bunce, Kevin, 4,648,421, Cl. 137-312.000.
Motomak Motorenbau, Maschinen-und Werkzeugfabrik Konstruktionen GmbH: *See—*
Schaeffler, Georg, 4,648,360, Cl. 123-90.550.
Motomiya, Teruaki: *See—*
Kuwano, Hiroaki; Matsushita, Toshiro; Kakuma, Hideaki; and Motomiya, Teruaki, 4,648,580, Cl. 251-129.010.
Motoori, Ryuzo: *See—*
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Motorenfabrik Hatz GmbH & Co. KG: *See—*
Kastlunger, Siegfried, 4,648,362, Cl. 123-182.000.
Motorola, Inc.: *See—*
Birrittella, Mark S., 4,649,411, Cl. 357-36.000.
Chang, Victor A.; Reyes, Angel A.; Jegers, Martin P.; and Valias-Jean, Frantz, 4,649,092, Cl. 429-217.000.
DeLuca, Michael J.; and Siegel, William G., 4,649,538, Cl. 371-25.000.
Guerin, Thomas R.; and Lester, Theodore V., 4,649,325, Cl. 315-383.000.
Krinock, Jerome V., 4,649,536, Cl. 370-102.000.
Levine, Stephen N., 4,649,543, Cl. 371-41.000.
MacGregor, Douglas B.; and Moyer, William C., 4,649,477, Cl. 364-200.000.
Mansmann, Jeffrey G.; and McEntarfer, Philip W., 4,649,326, Cl. 318-293.000.
McLaughlin, Kevin L., 4,649,294, Cl. 307-446.000.
McLaughlin, Kevin L.; and Seelbach, Walter C., 4,649,295, Cl. 307-446.000.
Rusznyak, Andreas, 4,649,292, Cl. 307-362.000.
Sibigtroth, James M., 4,649,476, Cl. 364-200.000.
Sonnenberg, John R., 4,649,353, Cl. 331-8.000.
Mouhot, Frederic; Barnabe, Jean-Pierre; Hoblingre, Andre ; and Clerc, Michel, to Cycles Peugeot. Fixing device for a tubular part, in particular for the steering column of a vehicle. 4,648,624, Cl. 280-775.000.
Moulinex Societe Anonyme: *See—*
Trocherie, Jean-Pierre, 4,648,720, Cl. 366-306.000.
Moulu, Jean-Claude: *See—*
Baviere, Marc; Moulu, Jean-Claude; Paal, Tibor; Tiszai, Gyorgy; Gaal, Gyorgyi; Schmidt, Laszlo; and Gesztesi, Gyula, 4,648,451, Cl. 166-273.000.
Mount, Houston B., II, to Amoco Corporation. Telemetry scheme with slope modulated signal. 4,649,550, Cl. 375-37.000.
Mowles, Thomas F.: *See—*
Felix, Arthur M.; Heimer, Edgar P.; and Mowles, Thomas F., 4,649,131, Cl. 514-12.000.
Moyer, William C.: *See—*
MacGregor, Douglas B.; and Moyer, William C., 4,649,477, Cl. 364-200.000.
Mucha, Horst: *See—*
Reinmold, Heinz-Josef; Mucha, Horst; and Friedrich, Heinz-Dieter, 4,648,210, Cl. 51-165.770.
Mudd, Robert E.; and Wyatt, Wendell L., to National Environmental Services, Inc. Method for treating oil field wastes containing hydrocarbons. 4,648,333, Cl. 110-346.000.
Mueller, Michael: *See—*
Leyrer, Reinhold J.; Wegner, Gerhard; and Mueller, Michael, 4,649,100, Cl. 430-326.000.
Mueller, Peter. Adjusting mechanism for variable pitch watercraft propellers. 4,648,847, Cl. 440-50.000.
Mueller, Richard A.; and Partis, Richard A., to G. D. Searle & Co. Treating elastin degradation with 1-(alkesoyl)azacycloalkyl carboxylic acids and derivatives. 4,649,147, Cl. 514-315.000.
Mueller, Richard A.: *See—*
Partis, Richard A.; and Mueller, Richard A., 4,649,157, Cl. 514-545.000.
Mukohjima, Hitoshi; and Hiramatsu, Akira, to Canon Kabushiki Kaisha. Vibration wave motor. 4,649,311, Cl. 310-323.000.
Mukunoki, Yasuo; Yokoyama, Shigeki; Kawasaki, Hiroshi; Nemori, Ryoichi; and Takeuchi, Tetsuo, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 4,649,102, Cl. 430-527.000.
Mulac, Anthony J.: *See—*
Eisenhawer, Stephen; Mulac, Anthony J.; Donaldson, A. Burl; and Fox, Ronald L., 4,648,835, Cl. 431-4.000.
Mullen, George B.: *See—*
Georgiev, Vassil S.; Mullen, George B.; and Swift, Patricia A., 4,649,222, Cl. 564-459.000.
Muller, Hartwig: *See—*
Neuer, Andreas; Grimmer, Eberhard; and Muller, Hartwig, 4,648,249, Cl. 66-75.200.
Muller, Jacques: *See—*
Mock, Elmar; and Muller, Jacques, 4,648,722, Cl. 368-294.000.
Muller, John T., to Leslie Company. Regulating valve. 4,648,553, Cl. 236-80.00R.
Muller, Rolf; Niederer, Hans; and Hahn, Othmar, to Ciba-Geigy Corporation. Process for the preparation of 1-amino-2-bromo-4-hydroxyanthraquinone. 4,648,994, Cl. 260-380.000.
Mulvihill, Mark A.: *See—*
Thorsell, Paul W.; and Mulvihill, Mark A., 4,648,985, Cl. 252-32.500.
Munie, Gregory C.: *See—*
Mahler, James A.; and Munie, Gregory C., 4,648,547, Cl. 228-180.100.
Munk, Barbara H.: *See—*
Smith, William L.; and Munk, Barbara H., 4,648,987, Cl. 252-559.000.
Murakami, Kanemitsu: *See—*
Kikuchi, Masahiro; Kobori, Yuzuru; and Murakami, Kanemitsu, 4,649,318, Cl. 313-449.000.
Murakami, Keiichi: *See—*
Klepper, John R.; Reid, John M.; Miwa, Hirohide; Shimura, Takaki; and Murakami, Keiichi, 4,648,276, Cl. 73-599.000.
Murata Manufacturing Co., Ltd.: *See—*
Azuchi, Yukihiro, 4,649,459, Cl. 361-293.000.
Nakamura, Takeshi; Matsumoto, Ikuo; and Ando, Kenji, 4,649,310, Cl. 310-321.000.
Ogawa, Toshio; Fujishima, Satoru; and Ando, Akira, 4,649,313, Cl. 310-358.000.
Murata, Masayoshi: *See—*
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Murayama, Kenji: *See—*
Maki, Takao; Murayama, Kenji; and Asahi, Yoshio, 4,649,217, Cl. 562-528.000.
Murayama, Satoshi: *See—*
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Murray, Donald L.: *See—*
Fox, Steve A.; Murray, Donald L.; and Dinkin, Frederick, 4,648,414, Cl. 132-43.00R.
Murray, Peter; and Slinn, David, to Shieldalloy Corporation. Introducing one or more metals into a melt comprising aluminum. 4,648,901, Cl. 75-68.00R.
Mushika, Sadahiko: *See—*
Oumi, Takeharu; Kageyama, Toshinobu; and Mushika, Sadahiko, 4,648,385, Cl. 128-1.00D.
Nabisco Brands, Inc.: *See—*
Thulin, Robert, 4,648,821, Cl. 425-133.100.

Nagae, Yoshiharu: *See*—
Kitazima, Masaaki; Kawakami, Hideaki; and Nagae, Yoshiharu, 4,649,517, Cl. 365-108.000.

Nagai, Kiyoshi; and Sakamoto, Nobuyoshi, to Oki Electric Industry Co., Ltd. Surface-acoustic-wave filter. 4,649,357, Cl. 333-196.000.

Nagaoka, Shinji, to Seiko Koki Kabushiki Kaisha. Distance detecting device for a camera. 4,648,700, Cl. 354-403.000.

Nagata, Mitsuo: *See*—
Oguchi, Koichi; Hosokawa, Minoru; Yazawa, Satoru; and Nagata, Mitsuo, 4,648,691, Cl. 350-338.000.

Nagata, Tetsuya, to Seiko Seiki Kabushiki Kaisha. Compact grinder machine. 4,648,213, Cl. 51-166.00R.

Nagata, Yoichi: *See*—
Ishikawa, Toshikatsu; Teranishi, Haruo; Imai, Yoshikazu; and Nagata, Yoichi, 4,649,060, Cl. 427-57.000.

Nagra, Surjit S.; and Strilchuk, Andrew R., to Exxon Production Research Co. Process for remedial cementing. 4,648,453, Cl. 166-281.000.

Nagumo, Mutsumi: *See*—
Miyoshi, Noriomi; Tsuruoka, Michihiko; and Nagumo, Mutsumi, 4,648,280, Cl. 73-861.240.

Nagura, Shigehiro: *See*—
Takamizawa, Minoru; Yamamoto, Akira; Ishihara, Toshinobu; and Nagura, Shigehiro, 4,649,185, Cl. 526-279.000.

Naimer, Hubert L. Reset mechanism for a rotary switch. 4,649,358, Cl. 335-116.000.

Naismith, John A.; McCormick, Malcolm; Howe, David; and Pate, Malcolm A., to National Research Development Corp. Chromium electroplating and bath therefor. 4,648,947, Cl. 204-51.000.

Nakada, Akio, to Olympus Optical Co., Ltd. Resectoscope. 4,648,399, Cl. 128-303.140.

Nakagawa, Shuichi: *See*—
Kimura, Toshio; Nakagawa, Shuichi; Tokumo, Teruhiko; Yamamoto, Hiroyuki; Kotan, Hiroshi; Otsu, Hiroshi; and Satoh, Tetsuya, 4,649,399, Cl. 346-32.000.

Nakagawa, Tohru; Sakurai, Yasuo; and Makizawa, Yoshiaki, to Matsushita Electric Industrial Co., Ltd. Industrial robot employing direct drive operation. 4,648,785, Cl. 414-744.00A.

Nakagawa, Yukio; and Motoori, Ryuzo, to Nippon Kogaku K. K. Image processing apparatus in film image phototelegraphy. 4,649,436, Cl. 358-280.000.

Nakajima, Hiroyasu, to Hitachi, Ltd. Thin film magnetic head having a sliding surface. 4,649,448, Cl. 360-122.000.

Nakajima, Kihei, to Kabushiki Kaisha Toshiba. Method of and system for controlling a photovoltaic power system. 4,649,334, Cl. 323-299.000.

Nakajima, Masahiko, to Nakajima Ookosho Company Ltd. Heating apparatus using liquefied gas. 4,648,380, Cl. 126-414.000.

Nakajima Ookosho Company Ltd.: *See*—
Nakajima, Masahiko, 4,648,380, Cl. 126-414.000.

Nakamura, Hisao; and Iwano, Shoji, to Japan Styrene Paper Corporation. Process for producing polyethylene extruded foams. 4,649,001, Cl. 264-50.000.

Nakamura, Kazumasa: *See*—
Nomura, Yoshihisa; Ishikawa, Masakazu; Shirai, Akira; Nogami, Takahiro; Nakamura, Kazumasa; and Ohashi, Kaoru, 4,648,663, Cl. 303-106.000.

Nakamura, Shigekazu. Apparatus using inclined sensor for detecting relative displacement. 4,649,342, Cl. 324-208.000.

Nakamura, Shinichi: *See*—
Matsumoto, Jun-ichi; Miyamoto, Teruyuki; Uno, Hitoshi; and Nakamura, Shinichi, 4,649,144, Cl. 514-300.000.

Nakamura, Shinya: *See*—
Kubo, Seitoku; Taga, Yutaka; and Nakamura, Shinya, 4,648,289, Cl. 74-866.000.

Nakamura, Shiochiro; and Kable, Robert G., to Scriptel Corporation. Electrographic apparatus. 4,649,232, Cl. 178-18.000.

Nakamura, Takeshi; Matsumoto, Ikuo; and Ando, Kenji, to Murata Manufacturing Co., Ltd. Piezoelectric vibrating element. 4,649,310, Cl. 310-321.000.

Nakamura, Takeshi: *See*—
Moriya, Masaichi; Maekawa, Junichi; and Nakamura, Takeshi, 4,648,206, Cl. 49-352.000.

Nakamura, Taku; and Hirai, Hiroyuki, to Fuji Photo Film Co., Ltd. Heat developable light-sensitive material. 4,649,104, Cl. 430-617.000.

Nakano, Hiroyuki: *See*—
Tanahashi, Maki; Horiike, Sumio; and Nakano, Hiroyuki, 4,649,364, Cl. 338-14.000.

Nakano, Tomio, to Fujitsu Limited. Circuit for maintaining the potential of a node of a MOS dynamic circuit. 4,649,289, Cl. 307-246.000.

Nakano, Tomio: *See*—
Takemae, Yoshihiro; Nakano, Tomio; and Sato, Kimiaki, 4,649,406, Cl. 357-23.600.

Nakao, Kenji: *See*—
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Nakasone, Hidetaka: *See*—
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Namiki, Mitsuo; Osawa, Toshihiko; Fukuda, Yasuko; and Ozaki, Tatsuhiko, to Takemoto Yushi Kabushiki Kaisha. Lignan compound. 4,649,206, Cl. 549-435.000.

Nanba, Yoichi: *See*—
Ueda, Jun; Tsukada, Hirokazu; and Nanba, Yoichi, 4,649,414, Cl. 357-53.000.

Narita, Seiichi: *See*—
Ota, Kazuomi; Kato, Minoru; Narita, Seiichi; and Moriya, Mitutoshi, 4,649,282, Cl. 250-574.000.

Naruki, Yukio; and Yasuda, Takeshi, to Casio Computer Co., Ltd. Thermal printer control device. 4,649,400, Cl. 346-76.0PH.

Nashef, Aws S.: *See*—
Carpentier, Alain; Carpentier, Sophie; and Nashef, Aws S., 4,648,881, Cl. 623-11.000.

National Distillers and Chemical Corporation: *See*—
Rekers, Louis J.; Speca, Anthony N.; and Mayhew, Harry W., 4,649,128, Cl. 502-109.000.

National Element, Inc.: *See*—
Best, Lorne A., 4,649,368, Cl. 338-283.000.

National Environmental Services, Inc.: *See*—
Mudd, Robert E.; and Wyatt, Wendell L., 4,648,333, Cl. 110-346.000.

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Naismith, John A.; McCormick, Malcolm; Howe, David; and Pate, Malcolm A., 4,648,947, Cl. 204-51.000.

National Semiconductor Corporation: *See*—
Hebert, David F., 4,649,415, Cl. 357-74.000.
Yamanouchi, Roy K., 4,649,299, Cl. 307-480.000.

National Union Electric Corp.: *See*—
Hampton, Leonard; and Hohulin, Samuel E., 4,648,149, Cl. 15-360.000.

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Metz, Werner A., Jr.; Szluk, Nicholas J.; Miller, Gayle W.; Drury, Michael J.; and Sullivan, Paul A., 4,648,175, Cl. 29-589.000.
Osmera, Miroslav S.; Bella, Anton; Kallin, Fredrik L. N.; and Evans, Edward R., 4,648,591, Cl. 271-305.000.

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Nebel, David J.: *See*—
Rolle, Thomas E.; Nebel, David J.; Shulan, John L.; and Liljestrom, William P., 4,648,560, Cl. 241-24.000.

Nebon, Jean-Pierre: *See*—
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NEC Corporation: *See*—
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Inaba, Masao; Takahashi, Hiroshi; Nosaka, Kazuhiko; and Hattori, Takahiko, 4,649,507, Cl. 364-724.000.
Ishii, Eiichi, 4,649,327, Cl. 318-310.000.
Nukiyama, Tomoji, 4,649,512, Cl. 364-900.000.

Nees, Stephan, to Buhler, Edmund, a part interest. Apparatus for the pure preparation of particles, biological cell systems and colloids. 4,648,863, Cl. 494-17.000.

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Lipschutz, Paul, 4,649,272, Cl. 250-229.000.

Nelson, Dennis L.: *See*—
Callthorp, Glen R.; Norcross, Kenneth L., III; and Nelson, Dennis L., 4,648,967, Cl. 210-136.000.

Nelson, Robert F.: *See*—
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Nelson, Robert S.; and Zach, Reuven D. High resolution breast imaging device utilizing non-ionizing radiation of narrow spectral bandwidth. 4,649,275, Cl. 250-358.100.

Nemori, Ryoichi: *See*—
Mukunoki, Yasuo; Yokoyama, Shigeki; Kawasaki, Hiroshi; Nemori, Ryoichi; and Takeuchi, Tetsuo, 4,649,102, Cl. 430-527.000.

Nemoto, Isao, to Nemoto Kikaku Kogyo Co., Ltd. Ball-retaining structure in a power transmission apparatus. 4,648,286, Cl. 74-425.000.

Nemoto Kikaku Kogyo Co., Ltd.: *See*—
Nemoto, Isao, 4,648,286, Cl. 74-425.000.

Netsal-Maschinen AG: *See*—
Laimer, Friedrich; and Neugebauer, Hermann, 4,648,827, Cl. 425-208.000.

Neubauer, Walter: *See*—
Egner-Walter, Bruno; Neubauer, Walter; Schmid, Eckhardt; and Scholl, Wolfgang, 4,648,148, Cl. 15-250.210.

Neuer, Andreas; Grimmer, Eberhard; and Muller, Hartwig, to VEB Kombinat Textima. Needle selecting arrangement for knitting machines. 4,648,249, Cl. 66-75.200.

Neugebauer, Hermann: *See*—
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Neuhaus, Detlev: *See*—
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Neumann, Dietrich. Coupling head for pressure medium lines of pressure medium brake units in vehicles. 4,648,581, Cl. 251-149.600.

Neumann, Peter: *See*—
Fischer, Juergen; Zeiner, Hartmut; Nissen, Dietmar; Heinz, Gerhard; and Neumann, Peter, 4,649,080, Cl. 428-419.000.

Neumock, Udo: *See*—
Ley, Hans; Neumock, Udo; Scholz, Peter; Seidler, Horst; Berghaus, Horst; and Schmidt, Manfred, 4,648,295, Cl. 82-18.000.

New Nippon Electric Co., Ltd.: *See*—
Inaba, Masao; Takahashi, Hiroshi; Nosaka, Kazuhiko; and Hattori, Takahiko, 4,649,507, Cl. 364-724.000.

Newman, William R., to Kimberly-Clark Corporation. Package and disposal container including plural tear portions. 4,648,513, Cl. 206-614.000.

Ney, Reuben E.: *See*—
Pass, Raymond V.; Schroeder, James L., III; and Ney, Reuben E., 4,648,681, Cl. 339-147.00R.
NGK Insulators, Ltd.: *See*—
Matsui, Minoru; and Tsuno, Nobuo, 4,648,308, Cl. 92-212.000.
Takeuchi, Yukihisa; and Masumori, Hideo, 4,649,125, Cl. 501-15.000.
NGK Spark Plug Co., Ltd.: *See*—
Kondo, Kazuo; and Sukegawa, Tsuneyuki, 4,649,070, Cl. 428-209.000.
Niederer, Hans: *See*—
Muller, Rolf; Niederer, Hans; and Hahn, Othmar, 4,648,994, Cl. 260-380.000.
Nielsen, Alf. Electrical universal connecting box. 4,649,230, Cl. 174-65.00R.
Niigata Engineering Co., Ltd.: *See*—
Yasukawa, Hiroshi, 4,648,171, Cl. 29-568.000.
Niles, Gerald J., to Minnesota Mining and Manufacturing Company. Hanging holder for tape cassette. 4,648,514, Cl. 211-41.000.
Nilsen, Gunnar; Wang, Erik; and Moen, Ingar, to A/S Norsk Elektrisk & Brown Boveri. Power line/transformer switch. 4,649,237, Cl. 200-15.000.
Nippon Kogaku K. K.: *See*—
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Nippon Kogaku K.K.: *See*—
Mizutani, Norio; and Kasai, Toshiyuki, 4,648,695, Cl. 353-28.000.
Nippon Piston Ring Co., Ltd.: *See*—
Sakamaki, Hiroshi; Sugishita, Susumu; Horikoshi, Yukio; and Yanagihashi, Kikuji, 4,648,818, Cl. 418-173.000.
Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, 4,648,819, Cl. 418-173.000.
Umeha, Genkichi; Urano, Shigeru; Hirakawa, Osamu; and Takegushi, Shunsuke, 4,649,011, Cl. 264-267.000.
Nippon Seiko Kabushiki Kaisha: *See*—
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Nippon Steel Corporation: *See*—
Minamida, Katsuhiro; Takafuji, Hideo; Haga, Hiroya; and Mizuhashi, Nobuo, 4,649,256, Cl. 219-121.0LD.
Nippondenso Co., Ltd.: *See*—
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Yamamoto, Akinori; and Kurii, Masaaki, 4,649,398, Cl. 343-903.000.
Nirdosh, Inderjit. Processes for extraction of uranium and radium from uranium-containing ores using ferric nitrate. 4,649,029, Cl. 423-8.000.
Nishikawa, Eikichi, to Yamaoka Industry Corporation. Roaster. 4,648,378, Cl. 126-21.00A.
Nishikawa, Reiji: *See*—
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Nishimoto, Hideo: *See*—
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Nishimura, Keizo; Kobayashi, Masaharu; Okamoto, Hiroo; Noguchi, Takaharu; Arai, Takao; and Shibuya, Toshifumi, to Hitachi, Ltd. Digital signal transmission method providing high error correction capability. 4,649,542, Cl. 371-39.000.
Nissan Motor Co., Ltd.: *See*—
Hayashi, Yoshimasa, 4,648,356, Cl. 123-41.210.
Hayashi, Yoshimasa, 4,648,357, Cl. 123-41.270.
Oshiage, Katsunori, 4,649,486, Cl. 364-424.100.
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Nisshin-Dca Foods Inc.: *See*—
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Nisshin Flour Milling Co., Ltd.: *See*—
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Nitta, Atsuhiko: *See*—
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Noda, Takaaki; and Terai, Hiroshi, to Sumitomo Heavy Industries, Ltd. Method for controlling electrostatic precipitator. 4,648,887, Cl. 55-2.000.
Nogami, Takahiro: *See*—
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Noguchi, Masahiko: *See*—
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Noguchi, Takaharu: *See*—
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Noguchi, Yoshikazu; Yokoi, Tatsuhisa; Takeya, Eisaku; and Osawa, Hideyuki, to Toyota Jidosha Kabushiki Kaisha; and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Intake manifold for internal combustion engine having exhaust gas recirculation system. 4,648,373, Cl. 123-568.000.
Nohara, Shigezo; Sugimoto, Takeshi; Sakano, Kozaburo; Ohkubo, Yoshimichi; and Matsuo, Junichi, to Toyo Seikan Kaisha, Ltd. Process for production of multi-layer pipes for draw-forming. 4,649,004, Cl. 264-85.000.
Nojima, Shoshichi; Nomura, Hiroaki; and Tsushima, Susumu, to Takeda Chemical Industries, Ltd. Ketoalkylphospholipids. 4,649,203, Cl. 548-112.000.
Nola, Frank J., to United States of America, National Aeronautics and Space Administration. Bidirectional control system for energy flow in solar powered flywheel. 4,649,287, Cl. 307-31.000.
Nolf, Jean-Marie E.; Genbrugge, Hubert; Buekers, Valere; Mendes, Luiz N.; Doucet, Jos; and Vansant, Jan, to N.V. Raychem S.A. Optical fibre breakout. 4,648,168, Cl. 29-447.000.
Nolf, Jean-Marie E., to N.V. Raychem S.A. Branch-off method. 4,648,924, Cl. 156-85.000.
Nomura, Hiroaki: *See*—
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Nomura, Yoshihisa; Ishikawa, Masakazu; Shirai, Akira; Nogami, Takahiro; Nakamura, Kazumasa; and Ohashi, Kaoru, to Toyota Jidosha Kabushiki Kaisha. Wheel slip controlling system. 4,648,663, Cl. 303-106.000.
Nonomura, Keisaku: *See*—
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Nooi, Jacobus R.: *See*—
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Noorlander, Daniel O. Teat cup assembly with automatic cut off valve. 4,648,350, Cl. 119-14.320.
Norcross, Kenneth L., III: *See*—
Calltharp, Glen R.; Norcross, Kenneth L., III; and Nelson, Dennis L., 4,648,967, Cl. 210-136.000.
Nordeen, Charles K.: *See*—
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North American Philips Corporation: *See*—
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Northern Telecom Limited: *See*—
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Northrop Corporation: *See*—
Bouchard, John; and Ray, Robin, 4,648,284, Cl. 74-5.460.
Gerhardt, Heinz A., 4,648,571, Cl. 244-207.000.
Lawther, Robert J., 4,648,323, Cl. 102-495.000.
Northwestern University: *See*—
Rinik, Christine; Cohen, Jerome B.; and Hilliard, John E., 4,649,556, Cl. 378-71.000.
Norton, Peter R.: *See*—
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Nosaka, Kazuhiko: *See*—
Inaba, Masao; Takahashi, Hiroshi; Nosaka, Kazuhiko; and Hattori, Takahiko, 4,649,507, Cl. 364-724.000.
Nukiyama, Tomoji, to NEC Corporation. Interface circuit having a shift register inserted between a data transmission unit and a data reception unit. 4,649,512, Cl. 364-900.000.
Nuovo Pignone S.p.A.: *See*—
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Nurminen, John I.: *See*—
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Nuss, Sheldon E., to Ford Motor Company. Adjustable suspension stabilizer bar. 4,648,620, Cl. 280-689.000.
Nutter, Harry A., Jr., to United Technologies Corporation. Method of making fiber reinforced articles. 4,648,921, Cl. 156-77.000.
Nutzel, Oswald; and Zimmermann, Egbert, to Dyckerhoff & Widmann Aktiengesellschaft. Apparatus for and method of assembling a tension tie member. 4,648,146, Cl. 14-21.000.
Nutzel, Oswald: *See*—
Zimmermann, Egbert; and Nutzel, Oswald, 4,648,147, Cl. 14-21.000.
N.V. Raychem S.A.: *See*—
Nolf, Jean-Marie E.; Genbrugge, Hubert; Buekers, Valere; Mendes, Luiz N.; Doucet, Jos; and Vansant, Jan, 4,648,168, Cl. 29-447.000.
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Nyman, Bror G.: *See*—
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O. I. Corporation: *See*—
Hall, Randall C., 4,649,124, Cl. 436-150.000.
Obara, Haruki, to Fanuc Limited. Wire-cut electric discharge machining method. 4,649,252, Cl. 219-69.00W.
Oberdorf, Manfred, to Maschinenfabrik Alfred Schmermund GmbH. Apparatus for feeding cigarettes to a packaging station. 4,648,235, Cl. 53-54.000.
Oberholtzer, Steven L. Hot water supply system. 4,648,426, Cl. 137-603.000.
Obermann, George, to Eaton Corporation. Pressure responsive assembly. 4,648,277, Cl. 73-725.000.
Occidental Chemical Corporation: *See*—
Geering, Emil J., 4,649,209, Cl. 558-46.000.
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Oda, Hajime: *See*—
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Oda, Takao: *See*—
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Odashima, Takashi, to Tekken Construction Co., Ltd. Automatic fire extinguisher with infrared ray responsive type fire detector. 4,648,462, Cl. 169-61.000.
Oddenino, Manrico, to ITW Fastex Italia S.p.A. Device for connecting an upholstery strengthening rod to a seat load-bearing structure. 4,648,735, Cl. 403-187.000.
Odor, Louis, to Rockwell International Corporation. Induction heating platen for hot metal working. 4,649,249, Cl. 219-10.730.
Ogasawara, Masafumi; Yamaguchi, Nobu; and Moriki, Yoshikazu, to Toray Industries, Inc. Melt-spinning apparatus. 4,648,826, Cl. 425-192.00S.
Ogawa, Hiroshi; Saito, Shinji; Mizuno, Chiaki; and Tamai, Yasuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,649,081, Cl. 428-447.000.
Ogawa, Toshio; Fujishima, Satoru; and Ando, Akira, to Murata Manufacturing Co., Ltd. Piezoelectric displacement element. 4,649,313, Cl. 310-358.000.
Ogihara, Masuo; Oda, Hajime; Seki, Yoichi; and Yamazaki, Hiroshi, to Seiko Koki Kabushiki Kaisha. Control circuit for program shutter. 4,648,701, Cl. 354-439.000.
Oguchi, Kiyoshi, to Dai Nippon Insatsu K.K. Negative-type resist sensitive to ionizing radiation. 4,649,099, Cl. 430-323.000.
Oguchi, Koichi; Hosokawa, Minoru; Yazawa, Satoru; and Nagata, Mitsuo, to Seiko Epson Kabushiki Kaisha. Liquid crystal display device having diffusely reflective picture electrode and pleochroic dye. 4,648,691, Cl. 350-338.000.
Ogura Clutch: *See*—
Arai, Shigeharu; and Otsuka, Minoru, 4,649,458, Cl. 361-152.000.
Ogura, Seiki; Riseman, Jacob; Rovedo, Nivo; and Schulz, Ronald N., to International Business Machines Corporation. Method of preventing asymmetric etching of lines in sub-micrometer range sidewall images transfer. 4,648,937, Cl. 156-643.000.
Ohara, Yuji: *See*—
Fukai, Nobutaka; Ohara, Yuji; and Agano, Toshitaka, 4,648,685, Cl. 350-6.600.
Ohashi, Hiromichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Radiation controllable thyristor with multiple non-concentric amplified stages. 4,649,410, Cl. 357-30.000.
Ohashi, Kaoru: *See*—
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Yokoya, Yuji; Buma, Shuuichi; Araki, Hitoshi; Miyata, Hiroshi; Hirose, Masanori; and Ohashi, Kaoru, 4,648,621, Cl. 280-707.000.
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Ohe, Makoto, to Mitsubishi Rayon Company, Ltd. Light diffusing device. 4,648,690, Cl. 350-321.000.
Ohhara, Minoru: *See*—
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Ohi Seisakusho Co., Ltd.: *See*—
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Ohki, Masaru; Hirosawa, Toshio; Kurihara, Junichi; and Miyazaki, Katsuto, to Hitachi, Ltd. Method of procedures linkage control. 4,649,480, Cl. 364-300.000.
Ohki, Masashi: *See*—
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Ohkubo, Yoshimichi: *See*—
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Ohmart, James G.: *See*—
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Ohmura, Yoshio: *See*—
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Ohsawa, Michitaka: *See*—
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Ohta, Morio; and Tsuchiya, Shizuo, to Casio Computer Co., Ltd.; and Casio Electronics Manufacturing Co., Ltd. Recording apparatus. 4,649,404, Cl. 346-160.000.
Oiles Industry Co., Ltd.: *See*—
Kitta, Toshiyuki; Tada, Hiroshi; and Ishikawa, Keizo, 4,648,224, Cl. 52-223.00R.
Oishi, Kengo: *See*—
Komiyama, Choji; and Oishi, Kengo, 4,648,507, Cl. 206-232.000.
Okada, Tsuneyoshi: *See*—
Yanase, Yukimasa; and Okada, Tsuneyoshi, 4,649,172, Cl. 524-413.000.
Okamoto, Hiroo: *See*—
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Okazaki, Koji: *See*—
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Oki Electric Industry Co., Ltd.: *See*—
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Castner, Raymond P.; Olechovsky, David F.; Brown, Philip S.; Sinha, Susanta; Keller, Harold T.; and Cheng, Wenche W., 4,649,493, Cl. 364-472.000.
Sinha, Susanta; Brown, Philip S.; Harman, Douglas G.; Keller, Harold T.; Olechovsky, David F.; and Cheng, Wenche W., 4,649,492, Cl. 364-472.000.
Olin Corporation: *See*—
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McDermott, Brian K., 4,648,324, Cl. 102-518.000.
Pryor, Michael J.; and Santella, Michael L., 4,648,437, Cl. 164-463.000.
Oliver, Dickon T.; and Stewart, D. Fred, to Aluminum Company of America. Rolling mill eccentricity compensation using actual measurement of exit sheet thickness. 4,648,257, Cl. 72-16.000.
Olliges, William E., to Bally Manufacturing Corporation. Video slot machine. 4,648,600, Cl. 273-138.00A.
Oltman, John E.; Dopp, Robert B.; and Carpenter, Denis D., to Rayovac Corporation. Seal tab for a metal-air electrochemical cell. 4,649,090, Cl. 429-29.000.
Oly, Pieter J.: *See*—
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Olympus Optical Co., Ltd.: *See*—
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Omega Electronics S.A.: *See*—
Tellan, Alberto; Desarzens, Pierre; and Deglon, Philippe, 4,649,322, Cl. 315-306.000.
Omron Tateisi Electronics Co.: *See*—
Sugiyama, Sadao; and Goto, Hiroshi, 4,648,723, Cl. 384-9.000.
Sugiyama, Sadao; and Goto, Hiroshi, 4,648,724, Cl. 384-9.000.
Tanahashi, Maki; Horiike, Sumio; and Nakano, Hiroyuki, 4,649,364, Cl. 338-14.000.
Yoshikawa, Norio, 4,649,262, Cl. 219-421.000.
Omura, Ikuo; Higaki, Tatsuhiko; and Yamauchi, Junichi, to Kuraray Co., Ltd. Dental lining composition. 4,648,844, Cl. 433-217.100.
Onder, Kemal: *See*—
Chen, Augustin T.; and Onder, Kemal, 4,649,180, Cl. 525-462.000.
O'Neil, Junior; and Plagens, Leonard D., to Lempco Industries, Inc. Antifriction bearing assembly for a die set or the like. 4,648,727, Cl. 384-49.000.
Ono, Kenzi, to Toyota Jidosha Kabushiki Kaisha. Construction of door glass guide in motor vehicle. 4,648,205, Cl. 49-374.000.
Ono, Noriki: *See*—
Shibasaki, Sohei; Iwasaki, Yasumasa; Ono, Noriki; Arai, Koichi; Maruyama, Koji; and Shimanari, Tatsumi, 4,648,706, Cl. 355-43.000.
Ono, Takashi: *See*—
Akiyama, Kazutoshi; and Ono, Takashi, 4,649,174, Cl. 524-841.000.
Opland, Samuel: *See*—
Bonis, Laszlo J.; Courville, George V.; and Opland, Samuel, 4,649,007, Cl. 264-148.000.
Opresko, Stephen T., to RCA Corporation. Multibeam electron gun having means for supporting a screen grid electrode relative to a main focusing lens. 4,649,317, Cl. 313-414.000.
Optima-Maschinenfabrik Dr. Buhler GmbH & Co.: *See*—
Zurn, Karl, 4,649,259, Cl. 219-243.000.
Orient Chemical Industries, Ltd.: *See*—
Akiyama, Kazutoshi; and Ono, Takashi, 4,649,174, Cl. 524-841.000.

Orient, Otto J.: *See*—
Chutjian, Ara; and Orient, Otto J., 4,649,273, Cl. 250-251.000.
Chutjian, Ara; Orient, Otto J.; and Aladzhadzhyan, Samuel H., 4,649,278, Cl. 250-423.00R.
Orlowski, Jan A.; and Butler, David V., to Scientific Pharmaceuticals, Inc. Method for repairing of veneered dental cast restoration. 4,648,845, Cl. 433-217.100.
Oronzio de Nora Impianti Elettrochimici S.p.A.: *See*—
Pellegri, Alberto, 4,648,946, Cl. 204-16.000.
O'Rourke, Dermot: *See*—
Wurtman, Richard J.; Wurtman, Judith J.; and O'Rourke, Dermot, 4,649,161, Cl. 514-654.000.
Osaka Gas Co., Ltd.: *See*—
Morita, Yutaka; Katayama, Masayoshi; and Kato, Takashi, 4,648,281, Cl. 73-861.910.
Osanai, Akinori; Niwa, Takao; and Gono, Takeshi, to Toyota Jidosha Kabushiki Kaisha. Apparatus for controlling continuously variable transmission. 4,649,485, Cl. 364-424.100.
Osanai, Akinori; Gono, Takeshi; and Niwa, Takao, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for controlling continuously variable transmission for vehicle. 4,649,487, Cl. 364-424.100.
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Osawa, Hideyuki: *See*—
Noguchi, Yoshikazu; Yokoi, Tatsuhisa; Takeya, Eisaku; and Osawa, Hideyuki, 4,648,373, Cl. 123-568.000.
Osawa, Kozo: *See*—
Hiramatsu, Tooru; Tami, Kazuya; and Osawa, Kozo, 4,648,335, Cl. 112-114.000.
Osawa, Toshihiko: *See*—
Namiki, Mitsuo; Osawa, Toshihiko; Fukuda, Yasuko; and Ozaki, Tatsuhiko, 4,649,206, Cl. 549-435.000.
Osberghaus, Rainer; and Kresse, Franz, to Henkel Kommanditgesellschaft auf Aktien. Powdery carpet cleaning preparation containing zeolite granulate. 4,648,882, Cl. 8-142.000.
Oscar Mayer Foods Corp.: *See*—
Total, Robert V., 4,648,237, Cl. 53-473.000.
Oseas, Jonathan: *See*—
Bass, Walter E.; Matyas, Stephen M.; and Oseas, Jonathan, 4,649,233, Cl. 380-21.000.
Oshiage, Katsunori, to Nissan Motor Co., Ltd. Control method for continuously variable transmission or the like. 4,649,486, Cl. 364-424.100.
Oskam, Herman, to Hunter Douglas International N.V. Vertical louvre blind and parts therefor. 4,648,436, Cl. 160-168.00R.
Osmera, Miroslav S.; Bella, Anton; Kallin, Fredrik L. N.; and Evans, Edward R., to NCR Corporation. Apparatus for pocketing documents in vertically aligned pockets. 4,648,591, Cl. 271-305.000.
Osterberg, Hans: *See*—
Hallberg, Hakan; Osterberg, Hans; and Olander, Einar, 4,648,343, Cl. 114-210.000.
Ota, Kazuomi; Kato, Minoru; Narita, Seiichi; and Moriya, Mitutoshi, to Nippondenso Co., Ltd. Smoke sensing apparatus of the light scattering type. 4,649,282, Cl. 250-574.000.
Otake, Noboru; Seto, Haruo; Sasaki, Tetsuo; Sugita, Masanori; and Hiramoto, Shigeru, to Nisshin Flour Milling Co., Ltd. Mycotrienin-related compounds. 4,649,135, Cl. 514-183.000.
Otsu, Hiroshi: *See*—
Kimura, Toshio; Nakagawa, Shuichi; Tokumo, Teruhiko; Yamamoto, Hiroyuki; Kotan, Hiroshi; Otsu, Hiroshi; and Satoh, Tetsuya, 4,649,399, Cl. 346-32.000.
Otsuka, Minoru: *See*—
Arai, Shigeharu; and Otsuka, Minoru, 4,649,458, Cl. 361-152.000.
Ott, Hans: *See*—
Keller, Guido; Spiess, Andreas; Ott, Hans; and Boegli, Rolf, 4,649,502, Cl. 364-519.000.
Ott, Karl-Heinz: *See*—
Kress, Hans-Jurgen; Bottenbruch, Ludwig; Witman, Mark; Kircher, Klaus; Lindner, Christian; and Ott, Karl-Heinz, 4,649,168, Cl. 524-130.000.
Otten, Joachim W., deceased: *See*—
Meininger, Fritz; Otten, Joachim W., deceased; Otten, Ursula, heir; and Rudolph nee Otten, Anna G., heir, 4,649,193, Cl. 534-622.000.
Otten, Ursula, heir: *See*—
Meininger, Fritz; Otten, Joachim W., deceased; Otten, Ursula, heir; and Rudolph nee Otten, Anna G., heir, 4,649,193, Cl. 534-622.000.
Oumi, Takeharu; Kageyama, Toshinobu; and Mushika, Sadahiko, to Aisin Seiki Kabushiki Kaisha. Apparatus for driving a medical appliance. 4,648,385, Cl. 128-1.00D.
Outboard Marine Corporation: *See*—
Prince, Anthony F., 4,648,497, Cl. 192-0.084.
Outokumpu Oy: *See*—
Hultholm, Stig-Erik; Lilja, Launo L.; Makitalo, Valto J.; and Nyman, Bror G., 4,648,973, Cl. 210-629.000.
Owens-Illinois, Inc.: *See*—
Johnson, Eric C., 4,648,831, Cl. 425-540.000.
Oy Tampella Ab: *See*—
Ahtola, Unto; and Kuusento, Jaakko, 4,648,467, Cl. 173-107.000.
Oy Wartsila Ab: *See*—
Collins, Geoff; and Juurmaa, Kimmo, 4,648,342, Cl. 114-40.000.
Ozaki, Tatsuhiko: *See*—
Namiki, Mitsuo; Osawa, Toshihiko; Fukuda, Yasuko; and Ozaki, Tatsuhiko, 4,649,206, Cl. 549-435.000.
Ozols, Karlis V. Force responsive device. 4,648,273, Cl. 73-516.0LM.
Paal, Tibor: *See*—
Baviere, Marc; Moulu, Jean-Claude; Paal, Tibor; Tiszai, Gyorgy; Gaal, Gyorgyi; Schmidt, Laszlo; and Gesztesi, Gyula, 4,648,451, Cl. 166-273.000.
Pabst, Richard E. Flow through filter with backflush clearing capability. 4,648,971, Cl. 210-354.000.
Packaging Industries Group, Inc.: *See*—
Foster, John K., 4,648,641, Cl. 292-264.000.
Paes, Malvolio L.: *See*—
Morritt, Graham N.; Paes, Malvolio L.; Conacher, Ian D.; Gutridge, John R.; and Snellgrove, Timothy R., 4,648,386, Cl. 128-4.000.
Pagani, Ferdinando: *See*—
Bietti, Giuseppe; Cereda, Enzo; Donetti, Arturo; Giachetti, Antonio; and Pagani, Ferdinando, 4,649,150, Cl. 514-392.000.
Palloch, Herbert; and Erndt, Hans, to Frankl & Kirchner GmbH & Co KG. Belt guard. 4,648,855, Cl. 474-144.000.
Panek, Edward J.; and Davis, Pauls, to BASF Corporation. Polyethers modified with alpha olefin oxides. 4,649,224, Cl. 568-624.000.
Panto, Gyorgy: *See*—
Matyas, Bela; Gerber, Pal; Solymos, Andras; Kaszanitzky, Ferenc; Panto, Gyorgy; and Leffler, Janos, 4,649,031, Cl. 423-20.000.
Pao, Yih-Ho: *See*—
Hashish, Mohamed A.; Kirby, Michael J.; and Pao, Yih-Ho, 4,648,215, Cl. 51-439.000.
Park, Chan W., to Gold Star Co., Ltd. Circuit for displaying selection of a channel in a television set. 4,649,429, Cl. 358-192.100.
Park, In P.: *See*—
Park, Sea C.; and Park, In P., 4,648,696, Cl. 354-83.000.
Park, Sea C.; and Park, In P. 35 mm Automatic focus camera containing an instant film. 4,648,696, Cl. 354-83.000.
Park, Young G. Golf cart. 4,648,612, Cl. 280-47.260.
Parker, John A.: *See*—
Achar, Bappalige N.; Fohlen, George M.; and Parker, John A., 4,649,189, Cl. 528-220.000.
Parker Vannifin Corporation: *See*—
Riefler, Roger G.; and Ellison, John E., 4,649,360, Cl. 335-255.000.
Parker, William T.: *See*—
Marks, Richard L.; and Parker, William T., 4,648,669, Cl. 339-75.00M.
Parrish, David R.: *See*—
Gash, Bruce W.; Arri, Luis E.; Hunt, Elton B., Jr.; and Parrish, David R., 4,648,450, Cl. 166-259.000.
Parrott, Stephen L.: *See*—
Kutes, Simon G.; and Parrott, Stephen L., 4,648,963, Cl. 208-216.00R.
Parslow, Michael W.; and Nooi, Jacobus R., to Lever Brothers Company. Detergent composition. 4,648,979, Cl. 252-8.800.
Partis, Richard A.; and Mueller, Richard A., to G. D. Searle & Co. Pharmaceutical compositions containing 5-phenyl-1,3-dioxoalkenyl compounds. 4,649,157, Cl. 514-545.000.
Partis, Richard A.: *See*—
Mueller, Richard A.; and Partis, Richard A., 4,649,147, Cl. 514-315.000.
Partnership of Robert Walker and Paul Lund: *See*—
Walker, Robert L.; Crowe, Dale A.; and Lund, Paul D., 4,649,369, Cl. 340-52.00R.
Parzefall, Walter, to INA Walzlager Schaeffler KG. Clutch release means. 4,648,500, Cl. 192-99.00S.
Pascal, Yves: *See*—
Holcblat, Alain H.; Sundheimer, Patrick; and Pascal, Yves, 4,648,354, Cl. 122-32.000.
Pass, Raymond V.; Schroeder, James L., III; and Ney, Reuben E., to AMP Incorporated. Filtered electrical plug. 4,648,681, Cl. 339-147.00R.
Pastoor, Jacobus: *See*—
van de Sluys, Willem L. N.; Pastoor, Jacobus; and Roelofs, Johannus C. M., 4,648,441, Cl. 165-111.000.
Pastorello, Fabio; and Troglia, Claudio, to Montedison S.p.A. Process for the manufacture of zeolites 4A having a high crystallinity and a fine granulometry and being particularly suitable for the formulation of detergent compositions. 4,649,036, Cl. 423-328.000.
Pate, Malcolm A.: *See*—
Naismith, John A.; McCormick, Malcolm; Howe, David; and Pate, Malcolm A., 4,648,947, Cl. 204-51.000.
Patel, Bhupendra: *See*—
Smith, Alan; and Patel, Bhupendra, 4,648,502, Cl. 198-399.000.
Patton, Charles W. Load handling apparatus. 4,648,647, Cl. 294-67.100.
Paul Forkardt GmbH & Co. KG: *See*—
Kempken, Rainer; Steinberger, Josef; and Ritschel, Johann, 4,648,170, Cl. 29-568.000.
Paul Rauschert GmbH & Co. Kg: *See*—
Ullrich, Hansjurgen; and Geipel, Werner, 4,648,972, Cl. 210-541.000.
Paulat, Klaus, to Steinhilber, Helmut. Transport device for paper sheets. 4,648,590, Cl. 271-272.000.
Pavlick, Michael J., to Budd Company, The. Portable stacking containers locking device. 4,648,764, Cl. 410-77.000.
PDA Engineering: *See*—
Mack, Thomas E., 4,648,802, Cl. 416-244.00A.
Pearlman, Gordon W.; and Carlson, Steven B., to Lightolier Incorporated. Microcomputer-controlled light switch. 4,649,323, Cl. 315-307.000.
Peck, Michael C.; and Jacobi, Dennis M., to Union Camp Corporation. Aqueous printing ink. 4,648,905, Cl. 106-24.000.

Peil, Archie W.: *See—*
Bishop, Thomas R.; Peil, Archie W.; and Foreman, Arnal B., Jr., 4,648,447, Cl. 166-173.000.

Pelczarski, Walter J., to Allied Corporation. Connector assembly for mass termination. 4,648,679, Cl. 339-99.00R.

Pellegri, Alberto, to Oronzio de Nora Impianti Elettrochimici S.p.A. Electrode for electrochemical processes, method for preparing the same and use thereof in electrolysis cells. 4,648,946, Cl. 204-16.000.

Pendleton, Richard A., to USM Corporation. Adjustable nose piece. 4,648,259, Cl. 72-391.000.

Penna, David E., to U. S. Philips Corporation. Video display system comprising an index store for storing reduced versions of pictures to be displayed. 4,649,380, Cl. 340-750.000.

Pennwalt Corporation: *See—*
Georgiev, Vassil S.; Mullen, George B.; and Swift, Patricia A., 4,649,222, Cl. 564-459.000.
Huber, Ludwig K.; and Reilly, James L., 4,649,167, Cl. 524-99.000.
Rosas, Robin R., 4,649,494, Cl. 364-478.000.

Pennzoil Company: *See—*
Deysarkar, Asoke K.; and Allen, James D., 4,648,263, Cl. 73-59.000.

Perkin-Elmer Corporation, The: *See—*
Yakovlevitch, Daniel; and Rotolico, Anthony J., 4,649,257, Cl. 219-121.0PP.

Perlman, Daniel, to Brandeis University. Methods for isolating mutant microorganisms from parental populations. 4,649,109, Cl. 435-30.000.

Perry, David S.: *See—*
Heil, Robert F.; and Perry, David S., 4,648,825, Cl. 425-186.000.

Personal Products Company: *See—*
Becker, Patricia E.; and Molee, Kenneth J., 4,648,876, Cl. 604-370.000.

Persson, Bertil: *See—*
Hall, Sture; and Persson, Bertil, 4,648,762, Cl. 409-138.000.

Persyk, Dennis E., to Siemens Gammasonics, Inc. Imaging dynodes arrangement. 4,649,268, Cl. 250-207.000.

Persyk, Dennis E., to Siemens Gammasonics, Inc. Dynodes arrangement for an electron multiplier. 4,649,269, Cl. 250-207.000.

Peters, David; Denick, John, Jr.; and Talwar, Anil K., to Warner-Lambert Company. Magnesium trisilicate suitable for preparation of medicament adsorbates of antinauseants. 4,649,041, Cl. 424-484.000.

Peters, Klaus-Jurgen: *See—*
Gmelin, Karl; Kubach, Hans; Maisch, Wolfgang; Peters, Klaus-Jurgen; and Schelhas, Peter, 4,648,368, Cl. 123-454.000.

Peterson, Weldon H.; and Morrison, Kenneth G., to Allied Corporation. Spinnerette for producing hollow trilobal cross-section filament. 4,648,830, Cl. 425-464.000.

Petit, Patrick: *See—*
Robin, Philippe; Micheron, Francois; Petit, Patrick; and Broussoux, Dominique, 4,649,312, Cl. 310-330.000.

Petro Fax, Inc.: *See—*
Tanasescu, Leo, 4,648,707, Cl. 355-45.000.

Petry, Charles J.: *See—*
Hazelett, Robert W.; Petry, Charles J.; and Platek, Stanley W., 4,648,438, Cl. 164-475.000.

Petzold, Werner P.; and Miller, Alan L., to Borg-Warner Automotive, Inc. Clutch control system for a continuously variable transmission. 4,648,496, Cl. 192-0.076.

Pezzoli, Luigi, to Vamatex S.p.A. Weft carrying grippers for shuttleless weaving looms. 4,648,429, Cl. 139-448.000.

Pfaff Industriemaschinen GmbH: *See—*
Mall, Gunther, 4,648,337, Cl. 112-153.000.

Pfeffer, Hans-Rudolf: *See—*
Gerhardinger, Dieter; Wegehaupt, Karl-Heinrich; and Pfeffer, Hans-Rudolf, 4,649,066, Cl. 427-387.000.

Pfeifer & Langen: *See—*
Schwengers, Dieter, 4,649,058, Cl. 426-658.000.

Phillips Petroleum Company: *See—*
Kutes, Simon G.; and Parrott, Stephen L., 4,648,963, Cl. 208-216.00R.
McGregor, Robert E.; and Hubbard, Thomas J., 4,649,386, Cl. 340-370.240.
Rush, Elton E., 4,649,350, Cl. 324-452.000.

Phillips Plastics Corporation: *See—*
Wollar, Burnell, 4,648,766, Cl. 411-41.000.

Phillips, Richard G. Emergency anti-torque control system and method for helicopters. 4,648,568, Cl. 244-17.190.

Pieczykolan, George S., to Central Sprinkler Corporation. Low preload self-sealing quick release valve for sprinkler head. 4,648,459, Cl. 169-38.000.

Pieper, Wolfgang: *See—*
Horn, Gunther; Pieper, Wolfgang; and Roeser, Heribert, 4,649,361, Cl. 336-192.000.

Pierce, Allan A., to Kimberly-Clark Corporation. Folding apparatus and method. 4,648,861, Cl. 493-333.000.

Pigeroulet, Jean: *See—*
Leblanc, Jean; Pigeroulet, Jean; and Rossignol, Francois, 4,648,556, Cl. 239-88.000.

Pike, Kelly A.: *See—*
Hardwick, Martha K.; Pike, Kelly A.; Evans, George D., II; Edwards, Ronald; and Norman, Jacob J., 4,648,868, Cl. 604-32.000.

Pitha, Josef, to United States of America, Health and Human Services. Therapy for retinoid pathogenesis. 4,649,040, Cl. 424-10.000.

Pitney Bowes Inc.: *See—*
Eckert, Alton B., 4,649,266, Cl. 235-432.000.
Manduley, Flavio; and Grisgraber, Edwin G., 4,649,490, Cl. 364-466.000.
Manduley, Flavio, 4,649,491, Cl. 364-464.000.

Plagens, Leonard D.: *See—*
O'Neil, Junior; and Plagens, Leonard D., 4,648,727, Cl. 384-49.000.

Planesi, Ronald D. Tobacco pipe bowl with associated honing tool. 4,648,411, Cl. 131-226.000.

Plastech International, Inc.: *See—*
Wise, Thomas W., 4,648,522, Cl. 220-5.00R.

Platek, Stanley W.: *See—*
Hazelett, Robert W.; Petry, Charles J.; and Platek, Stanley W., 4,648,438, Cl. 164-475.000.

Plicht, Hans-Jurgen; and Runkel, Heinrich, to Hebenstreit GmbH. Wafer baking automatic machine. 4,648,314, Cl. 99-373.000.

Plumb, Harry A.: *See—*
Leonard, John A.; and Plumb, Harry A., 4,649,328, Cl. 318-317.000.

Plummer, Harvey R., to AMCA International Corporation. Precision adjustment system for boring tools. 4,648,757, Cl. 408-12.000.

Plummer, William T.: *See—*
Guerra, John M.; and Plummer, William T., 4,649,324, Cl. 315-370.000.

Podder, Nitya G., to Ciba-Geigy Corporation. Process for the preparation of storage stable aqueous formulations of anionic dyes: amon exchange resin treatment. 4,648,883, Cl. 8-527.000.

Poeppelmeier, Kenneth R.; Funk, Walter G.; Steger, John J.; Fung, Shun C.; Cross, Virginia R.; and Kao, Jar-Lin, to Exxon Research and Engineering Company. Bound zeolite catalyst and process for using said catalyst. 4,648,960, Cl. 208-138.000.

Pohlig, Wolf-Dieter: *See—*
Milsch, Ulrich; and Pohlig, Wolf-Dieter, 4,648,279, Cl. 73-861.170.

Pola Chemical Industries Inc.: *See—*
Takasuka, Yutaka; Mohri, Kunihiko; and Kawaguchi, Akiko, 4,648,908, Cl. 106-308.00F.

Polaroid Corporation: *See—*
Guerra, John M.; and Plummer, William T., 4,649,324, Cl. 315-370.000.
Kiesel, Kenneth C.; and Wray, William R., 4,649,568, Cl. 382-41.000.

Polckemann, Birger H. Soldering iron. 4,648,545, Cl. 228-53.000.

Pollicott, Ian D.: *See—*
Butters, Brian C. F.; and Pollicott, Ian D., 4,649,076, Cl. 428-361.000.

Polster, Walter: *See—*
Brunn, Klaus; and Polster, Walter, 4,649,558, Cl. 378-97.000.

Polyplastics Co., Ltd.: *See—*
Takagaki, Hitohisa, 4,649,179, Cl. 525-400.000.
Yanase, Yukimasa; and Okada, Tsuneyoshi, 4,649,172, Cl. 524-413.000.

Pompe F.B.M. S.p.A.: *See—*
Maghenzani, Tersillo, 4,648,796, Cl. 415-215.000.

Poppelsdorf, Fedor; and Smith, Charles A., to Union Carbide Corporation. Hydrogenation of alkyl oxalates. 4,649,226, Cl. 568-864.000.

Porta Systems Corp.: *See—*
De Luca, Paul V.; Atun, Albert; and Shatzkin, Michael, 4,649,236, Cl. 379-327.000.
De Luca, Paul V.; Shaskan, Paul; and Belle-Oudry, Michael, 4,649,456, Cl. 361-119.000.

Porteous, Don D.; and Valle, Ornan, to Van R Dental Products, Inc. High strength dental impression composition. 4,648,906, Cl. 106-35.000.

Porter, James A., Jr., to Litton Resources Systems. Combination seismic cable. 4,649,530, Cl. 367-154.000.

Portoghese, Philip S.; and Lipkowski, Andrzej W., to University of Minnesota, Regents of the. Substituted pyrroles with opioid receptor activity. 4,649,200, Cl. 546-26.000.

Postle, Stephen R.; Elton, Peter J.; and Gregory, David P., to Ciba-Geigy AG. Diagnostic strips. 4,649,026, Cl. 422-56.000.

Potash Corporation of Saskatchewan Mining Limited: *See—*
Vance, James B., 4,649,524, Cl. 367-13.000.

Potter, William R.: *See—*
Dougherty, Thomas J.; Potter, William R.; and Weishaupt, Kenneth R., 4,649,151, Cl. 514-410.000.

PPG Industries, Inc.: *See—*
Friedlander, Charles B., 4,649,082, Cl. 428-461.000.

Preskitt, Jay. Pedal stroke adjuster for a bicycle or exercise machine. 4,648,287, Cl. 74-594.100.

Preuss, Bernhard; and Manthe, Karl-Heinz, to Siemens Aktiengesellschaft. Contact assembly for low-voltage circuit breakers with a two-arm contact lever. 4,649,247, Cl. 200-244.000.

Prince, Anthony F., to Outboard Marine Corporation. Single lever control. 4,648,497, Cl. 192-0.084.

Proebsting, Robert J., to Thomson Components-Mostek Corp. Error-correcting circuit having a reduced syndrome word. 4,649,540, Cl. 371-37.000.

Proehl, Scott: *See—*
Holycross, Mark; Saccocio, Edward J.; and Proehl, Scott, 4,648,699, Cl. 354-297.000.

Professional Video Association, Inc.: *See—*
Horan, Michael J., 4,648,604, Cl. 273-292.000.

Progressive Assembly Machine Co., Inc.: *See—*
Rasmussen, Robert, 4,648,533, Cl. 222-309.000.

Pronkin, Alexei A.: *See—*
Gaprindashvili, Khanzerifa I.; Kogan, Vadim E.; Kekelia, Dzhemal I.; Pronkin, Alexei A.; Salukvadze, Nana A.; Bakuradze, Georgy V.; and Evstropiev, Konstantin K., deceased, 4,649,126, Cl. 501-43.000.

Prueter, William P.: *See*—
Kidwell, John H.; Prueter, William P.; and Eaton, Andrew M., 4,648,890, Cl. 55-347.000.
Pryor, Michael J.; and Santella, Michael L., to Olin Corporation. Method for producing a metal alloy strip. 4,648,437, Cl. 164-463.000.
Puckett, Harley D., Jr.: *See*—
Martin, Mary S.; McCord, Elizabeth; Puckett, Harley D., Jr.; and Scrutchin, Thomas W., Jr., 4,649,513, Cl. 364-900.000.
Puddington, Ira E.: *See*—
Capes, Charles E.; Coleman, Richard D.; Thayer, William L.; and Puddington, Ira E., 4,648,962, Cl. 208-188.000.
Puisais, Xavier F.; Hamon, Jean-Pierre; Jegousse, Michel; and Kaluszynski, Michel, to Total Compagnie Francaise des Petroles. Internal chuck for butt welding two tubes. 4,648,544, Cl. 228-44.500.
Puma AG Rudolf Dassler Sport: *See*—
Dassler, Armin A.; and Bauer, Willi, 4,648,187, Cl. 36-134.000.
Punako, Stephen; and MacAvoy, David W., to Allied Corporation. Electrical connector assembly having anti-decoupling mechanism. 4,648,670, Cl. 339-89.00R.
Pund, Marvin L. Stereoscopic display. 4,649,425, Cl. 358-88.000.
Putman, Robert L.; and Dinse, Merle L., to United Technologies Corporation. Active clearance control. 4,648,241, Cl. 60-39.290.
Quest Medical, Inc.: *See*—
Robinson, Thomas P., 4,648,873, Cl. 604-411.000.
Quist, Per I.: *See*—
Marks, Gerald C.; and Quist, Per I., 4,648,922, Cl. 156-79.000.
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Rabe, William T., to TRW, Inc. Unloading valve for power steering piston with integral gear. 4,648,307, Cl. 91-375.00A.
Rabitsch, Benjamin F. Sprinkler assembly. 4,648,558, Cl. 239-228.000.
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Rasmussen, Robert, to Progressive Assembly Machine Co., Inc. Fluid dispensing system. 4,648,533, Cl. 222-309.000.
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Reid, Dwight K., to Betz Laboratories, Inc. Process and composition for stabilized distillate fuel oils. 4,648,885, Cl. 44-57.000.
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Reid, William F., to Ashland Oil, Inc. Abrasion resistant latex underbody coating. 4,649,170, Cl. 524-247.000.
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Elspass, Maroid, 4,648,305, Cl. 89-36.080.
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Riseman, Jacob: *See*—
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Hescher, Manfred; and Rosignol, Heinrich, 4,649,443, Cl. 360-84.000.
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Roe, Douglas: *See*—
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Rogier, Edgar R.: *See*—
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Rolle, Thomas E.; Nebel, David J.; Shulan, John L.; and Liljestrom, William P., to T.D.J. Co., Inc. Screen separator method for foundry waste materials. 4,648,560, Cl. 241-24.000.

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Rosas, Robin R., to Pennwalt Corporation. Method for maintaining zero calibration values in article sorting machine. 4,649,494, Cl. 364-478.000.

Rose, Richard. Bracket for supporting traction weights. 4,648,144, Cl. 5-503.000.

Rosen, Max. Jewelry clasp. 4,648,161, Cl. 24-589.000.

Rosenberg, Ruth, to Smith-Migatz, Dena, a part interest. Stuffed animal with changeable features. 4,648,851, Cl. 446-372.000.

Rosenberger, Michael: *See*—
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Rosenthal, Eli: *See*—
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Rosignol, Heinrich: *See*—
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Ross, Barry C.; and Michael, Jeffrey D., to Hoechst UK Limited. Thiazole derivatives. 4,649,145, Cl. 514-370.000.

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Ross, Oakley G.; Kline, Mark L.; and Wedertz, Larry D., to General Dynamics Pomona Division. Electrically-isolating coupler suitable for high pressure cryogenic gas flow. 4,648,926, Cl. 156-158.000.

Ross, Richard J.; and Klumpyan, Joseph N., to Baker Oil Tools, Inc. Injection control device for subterranean well conduit. 4,648,457, Cl. 166-332.000.

Rossean, Larry D.: *See*—
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Rossignol, Francois: *See*—
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Rosskopf, Gerhard; Seidel, Dietrich; and Wieland, Heinrich, to Intermedicat GmbH. Process for the selective extracorporeal separation of blood constituents. 4,648,974, Cl. 210-651.000.

Rosswurm, Mark A.; and Kesaler, Leland L., to Westinghouse Electric Corp. Random pattern lock and key fault detection scheme for microprocessor systems. 4,649,537, Cl. 371-16.000.

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Rotpunkt Dr. Anso Zimmermann: *See*—
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Roux, Michel, to L'Air Liquide. Process and apparatus for lubricating glass mold castings. 4,648,893, Cl. 65-26.000.

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Rowland, David L. Stackable armchair. 4,648,653, Cl. 297-239.000.

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Rubnerth, Oscar R. Collapsible awning support frame. 4,648,573, Cl. 248-273.000.

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Rule, Mark; Larkins, Thomas H., Jr.; Lane, Donald W.; and Steinmetz, Guy R., to Eastman Kodak Company. Carbonylation process for the production of aromatic acids. 4,649,216, Cl. 562-406.000.
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Rusconi, John B.; and Cole, Ronald A., to Max Kahn Curtain Corporation. Automatic bobbin and bobbin carrier changing apparatus for sewing machine. 4,648,338, Cl. 112-180.000.
Rush, Elton E., to Phillips Petroleum Company. Container piercing device. 4,649,350, Cl. 324-452.000.
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Rusznyak, Andreas, to Motorola, Inc. CMOS power-on detecting circuit. 4,649,292, Cl. 307-362.000.
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Terra, Luigi; Sada, Edoardo; and Colombo, Sergio, 4,649,277, Cl. 250-363.00S.
S + G Implants GmbH: *See*—
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Sabol, George P.; and McDonald, Samuel G., III, to Westinghouse Electric Corp. Process for fabricating a zirconium-niobium alloy and articles resulting therefrom. 4,649,023, Cl. 420-422.000.
Saccocio, Edward J.: *See*—
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Sackner, Marvin A., to Respitrace Corporation. Method for detecting and differentiating central and obstructive apneas in newborns. 4,648,407, Cl. 128-721.000.
Sada, Edoardo: *See*—
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Sadjian, Harry. Optical recording device. 4,649,518, Cl. 365-119.000.
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Sakamoto, Nobuyoshi: *See*—
Nagai, Kiyoshi; and Sakamoto, Nobuyoshi, 4,649,357, Cl. 333-196.000.
Sakamoto, Takao, to Tachikawa Spring Co., Ltd. Weight adjustment device for a seat suspension. 4,648,578, Cl. 248-576.000.
Sakamoto, Yasuhisa: *See*—
Ishii, Toshio; Sakamoto, Yasuhisa; and Takahashi, Isao, 4,648,381, Cl. 126-20.000.
Sakamoto, Yoichi: *See*—
Ibata, Akihiko; and Sakamoto, Yoichi, 4,648,915, Cl. 148-101.000.
Sakano, Kozaburo: *See*—
Nohara, Shigezo; Sugimoto, Takeshi; Sakano, Kozaburo; Ohkubo, Yoshimichi; and Matsuo, Junichi, 4,649,004, Cl. 264-85.000.
Sakurai, Seiya: *See*—
Herzog, Hans K.; and Sakurai, Seiya, 4,649,484, Cl. 364-424.000.
Sakurai, Terushige, to Kabushiki Kaisha Komatsu Seisakusho. Press machine. 4,648,786, Cl. 414-752.000.
Sakurai, Yasuo: *See*—
Nakagawa, Tohru; Sakurai, Yasuo; and Makizawa, Yoshiaki, 4,648,785, Cl. 414-744.00A.
Salukvadze, Nana A.: *See*—
Gaprindashvili, Khanzerifa I.; Kogan, Vadim E.; Kekelia, Dzhemal L; Pronkin, Alexei A.; Salukvadze, Nana A.; Bakuradze, Georgy V.; and Evstropiev, Konstantin K., deceased, 4,649,126, Cl. 501-43.000.
Sampson, Kendree J.: *See*—
Jenkins, Waylon L.; Hodge, Deborah T.; and Sampson, Kendree J., 4,649,186, Cl. 526-87.000.
Samuel, David: *See*—
Shanzer, Abraham; and Samuel, David, 4,649,218, Cl. 564-197.000.
Sanchez, Joseph J., Jr., to Allied Corporation. In-line fuseholder. 4,648,674, Cl. 339-97.00P.
Sanden Corporation: *See*—
Kokubun, Yoshikazu; Hatori, Kunitake; and Kanezashi, Takeshi, 4,648,313, Cl. 99-289.00R.
Sander, Hans-Dieter; and Streckenbach, Wulf-Christian, to Telefunken Fernseh und Rundfunk GmbH. Decoder for a frequency-keyed signal, particularly an FSK-video text signal. 4,649,551, Cl. 375-81.000.
Sanders Associates, Inc.: *See*—
Apostolos, John T., 4,649,392, Cl. 342-192.000.
Sandoz Ltd.: *See*—
Wicki, Heinz, 4,649,194, Cl. 534-693.000.
Sanford, Lawrence; Stokley, Charles O.; and Turner, Edwin C., to Tam International, Inc. Packer assembly. 4,648,448, Cl. 166-187.000.
Sangster, Frederik L. J.: *See*—
Kaizer, Adrianus J. M.; Sangster, Frederik L. J.; and Wesche, Cornelis A. M., 4,649,565, Cl. 381-90.000.
Sankyo Manufacturing Company, Ltd.: *See*—
Kato, Heizaburou; and Anma, Masao, 4,648,288, Cl. 74-798.000.
Sanok, John L.: *See*—
Reilly, Albert F.; and Sanok, John L., 4,648,832, Cl. 425-543.000.
Sansonetti, Pierre: *See*—
Menigaux, Louis; and Sansonetti, Pierre, 4,648,940, Cl. 156-649.000.
Santella, Michael L.: *See*—
Pryor, Michael J.; and Santella, Michael L., 4,648,437, Cl. 164-463.000.
Santos, Manuel V. Blood vessel dilating surgical instrument. 4,648,402, Cl. 128-345.000.
Santrade Limited: *See*—
Karlsson, Kurt O.; and Karlsson, Leif E., 4,648,760, Cl. 408-223.000.
Sanyo Densihkogyo Co. Ltd.: *See*—
Sato, Toru; and Moriya, Kozo, 4,648,395, Cl. 128-204.230.
Sanyo Electric Co: *See*—
Takizawa, Takashi; and Tanaka, Tsutomu, 4,648,247, Cl. 62-256.000.
Sanyo Electric Co., Ltd.: *See*—
Kitamura, Yuji; and Mitani, Nobuhiro, 4,649,407, Cl. 357-24.000.
Morishita, Takuya; Kurioka, Akihiko; and Morita, Akihiro, 4,648,150, Cl. 15-389.000.
Shono, Masahiro, 4,649,464, Cl. 363-21.000.
Sargeant, Nicholas B.: *See*—
Canton, David A.; Holloway, Brian L.; Sargeant, Nicholas B.; and Llewelyn, Roger J., 4,649,379, Cl. 340-750.000.
Sarstedt, Walter, to Walter Sarstedt Kunststoff-Spritzgusswerk. Blood sedimentation apparatus. 4,648,265, Cl. 73-61.400.
Sasaki, Tetsuo: *See*—
Otake, Noboru; Seto, Haruo; Sasaki, Tetsuo; Sugita, Masanori; and Hiramoto, Shigeru, 4,649,135, Cl. 514-183.000.
Sasaki, Yoshio: *See*—
Inoue, Hiroshi; and Sasaki, Yoshio, 4,649,175, Cl. 525-38.000.
Sato, Hiroshi: *See*—
Gomi, Tetsuo; Suganuma, Nobuo; Ishii, Kazuo; and Sato, Hiroshi, 4,649,044, Cl. 424-49.000.
Sato, Kimiaki: *See*—
Takemae, Yoshihiro; Nakano, Tomio; and Sato, Kimiaki, 4,649,406, Cl. 357-23.600.
Sato, Kozo: *See*—
Yabuki, Yoshiharu; Sato, Kozo; Kawata, Ken; and Hirai, Hiroyuki, 4,649,103, Cl. 430-570.000.
Sato, Noria: *See*—
Zenbayashi, Michio; and Sato, Noria, 4,649,208, Cl. 556-413.000.
Sato, Takahiro: *See*—
Kobayashi, Masaru; Koyanagi, Hironobu; and Sato, Takahiro, 4,649,005, Cl. 264-101.000.

Sato, Toru; and Moriya, Kozo, to Sanyo Densihkogyo Co. Ltd. Synchronized feed type oxygen concentrator for use in an open breathing system. 4,648,395, Cl. 128-204.230.

Satoh, Tetsuya: *See*—
Kimura, Toshio; Nakagawa, Shuichi; Tokumo, Teruhiko; Yamamoto, Hiroyuki; Kotan, Hiroshi; Otsu, Hiroshi; and Satoh, Tetsuya, 4,649,399, Cl. 346-32.000.

Satzinger, Gerhard: *See*—
Herrmann, Wolfgang; and Satzinger, Gerhard, 4,649,196, Cl. 540-479.000.

Sauer, Gerhard. Method of producing a subterranean structure. 4,648,743, Cl. 405-138.000.

Sauer, S.p.A.: *See*—
Cattani, Luciano, 4,648,829, Cl. 425-326.100.

Sauers, Marvin E.: *See*—
Hartsing, Tyler F., Jr.; and Sauers, Marvin E., 4,649,176, Cl. 525-67.000.

Saunders, Charles A. Self cleaning pressure button. 4,648,376, Cl. 124-41.00A.

Sauter, Martin, to Maag Gear-Wheel & Machine Company Limited. Gear pump with retaining rings for the end bushes. 4,648,816, Cl. 418-134.000.

Sauve, Laurier. Fishing lure with resilient stem. 4,648,198, Cl. 43-42.060.

Savini, Charles: *See*—
Yeh, Chuen Y.; and Savini, Charles, 4,649,223, Cl. 568-403.000.

Savov, Svetoslav A.; Mintchev, Mintcho S.; Nitchev, Peter T.; and Shivarov, Georgi S., to VMEI "Lenin". Method of controlling thermochemical treatment of workpieces in glow discharge in a treating gas medium and device which embodies this method. 4,648,952, Cl. 204-192.120.

Sawada, Takeshi; Toda, Yasushi; and Goto, Hirokazu, to Canon Kabushiki Kaisha. Perpendicular magnetic head. 4,649,449, Cl. 360-123.000.

Sawtell, Ralph R.: *See*—
Hunt, Warren H., Jr.; Sawtell, Ralph R.; and Bretz, Philip E., 4,648,913, Cl. 148-12.70A.

Sawyer, David A.: *See*—
Allan, Geoffrey; Miller, Alistair A.; and Sawyer, David A., 4,649,139, Cl. 514-242.000.

Sawyer, Wilbur H.: *See*—
Manning, Maurice; and Sawyer, Wilbur H., 4,649,130, Cl. 514-11.000.

Schad, Louis A. Apparatus for ventilating an enclosed area. 4,648,312, Cl. 98-75.000.

Schaeffer, Howard J., to Burroughs Wellcome Co. Purine derivatives. 4,649,140, Cl. 514-261.000.

Schaeffler, Georg, to Motomak Motorenbau, Maschinen-und Werkzeugfabrik Konstruktionen GmbH. Hydraulic valve tappet. 4,648,360, Cl. 123-90.550.

Schafer, Gerhard, to Fritz Schafer Gesellschaft mit beschrankter Haftung. Shelf support structure. 4,648,517, Cl. 211-183.000.

Scheel, Russell H.: *See*—
Gutekunst, Stanley K.; Scheel, Russell H.; and Ziegenfus, Barry L., 4,648,325, Cl. 104-166.000.

Schelhas, Peter: *See*—
Gmelin, Karl; Kubach, Hans; Maisch, Wolfgang; Peters, Klaus-Jurgen; and Schelhas, Peter, 4,648,368, Cl. 123-454.000.

Schellmann, Klaus, to Kolbenschmidt AG. Light alloy piston. 4,648,309, Cl. 92-233.000.

Scherer, Jeremy D.; and Tower, Steven A., to Aegis, Inc. All metal flat package for microcircuitry. 4,649,229, Cl. 174-52.0FP.

Scheuneman, James H., to Sperry Corporation. Multiple port memory with port decode error detector. 4,649,475, Cl. 364-200.000.

Schildbach, Peter: *See*—
Cardullo, Mario; Caraluzzi, Mark; and Schildbach, Peter, 4,649,056, Cl. 426-509.000.

Schildknecht, Kurt: *See*—
Borer, Claude; and Schildknecht, Kurt, 4,648,713, Cl. 356-246.000.

Schilling, Hugh K.; Dayen, Leonid; and Raines, Charles D., to Horton Manufacturing Co., Inc. Rotational control apparatus. 4,648,493, Cl. 192-18.00A.

Schippers, Heinz; and Hertell, Siegfried, to Barmag Barmer Maschinenfabrik AG. Control apparatus for a positive displacement reciprocating pump. 4,648,810, Cl. 417-383.000.

Schlachter, Siegfried, to Kaltenbach & Voigt GmbH & Co. Dental handpiece. 4,648,838, Cl. 433-29.000.

Schlage Lock Company: *See*—
Bettger, Richard R., 4,648,643, Cl. 292-347.000.

Schlanzke, Claus G.: *See*—
Berz, Gerhard; Braun, Hans J.; and Schlanzke, Claus G., 4,648,770, Cl. 414-30.000.

Schleffendorf, John J. Body training device. 4,648,594, Cl. 272-118.000.

Schlingmann, Merten: *See*—
Keller, Reinhold; and Schlingmann, Merten, 4,649,111, Cl. 435-89.000.

Schlossman, Stuart F.; and Morimoto, Chikao, to Dana-Farber Cancer Institute, Inc. Distinguishing subsets of human cells. 4,649,106, Cl. 435-7.000.

Schlumberger Technology Corporation: *See*—
Bordon, Ernesto E., 4,648,471, Cl. 175-4.550.

Schmerda, Richard F.: *See*—
Damiano, Michael A.; and Schmerda, Richard F., 4,649,302, Cl. 307-584.000.

Schmid, Eckhardt: *See*—
Egner-Walter, Bruno; Neubauer, Walter; Schmid, Eckhardt; and Scholl, Wolfgang, 4,648,148, Cl. 15-250.210.

Schmid, Rudolf, to Siemens Aktiengesellschaft. Gas laser. 4,649,546, Cl. 372-61.000.

Schmid, Theobald; Widmaier, Horst; and Wolf, Friedrich, to Hand Widmaier Fabrik fur Apparate der Fernmelde -und Feinwerktechnik. Keyboard for initiating switching operations or switching signals associated with respective symbols on the surfaces of the keys. 4,649,246, Cl. 200-159.00B.

Schmidt, Laszlo: *See*—
Baviere, Marc; Moulu, Jean-Claude; Paal, Tibor; Tiszai, Gyorgy; Gaal, Gyorgyi; Schmidt, Laszlo; and Geszteai, Gyula, 4,648,451, Cl. 166-273.000.

Schmidt, Manfred: *See*—
Ley, Hans; Neumock, Udo; Scholz, Peter; Seidler, Horst; Berghaus, Horst; and Schmidt, Manfred, 4,648,295, Cl. 82-18.000.

Schmidt, Richard: *See*—
Ross, Joseph; and Schmidt, Richard, 4,648,717, Cl. 356-376.000.

Schmidt, Roger A., to Cargill, Incorporated. Water reducible phenolic modified alkyd resin. 4,649,173, Cl. 524-539.000.

Schmidt, Walter E. Methods and apparatus for the protection and control of computer programs. 4,649,510, Cl. 364-900.000.

Schmidtberger, Rudolf: *See*—
Steuer, Dagmar; and Schmidtberger, Rudolf, 4,649,120, Cl. 436-13.000.

Schmitt, Eugene W.; and Campbell, Robert E., to Sloan Valve Company. Empty and load valve for a railroad car brake system. 4,648,661, Cl. 303-23.00R.

Schmitt, Ray F.; Gavin, Joseph A.; Kempel, Francis D.; and Waltrick, Charles N., deceased (by Waltrick, Steven B., Cathy M. Waltrick, legal representatives), to United States of America, Navy. Oil content monitor/control system. 4,649,281, Cl. 250-574.000.

Schmitz, Robert E.: *See*—
Brull, John J.; and Schmitz, Robert E., 4,648,214, Cl. 51-410.000.

Schmoelzer, Ernst, to Alfred Teves GmbH. Braking pressure control unit. 4,648,489, Cl. 188-195.000.

Schmukler, Robert E. Retrograde coronary sinus perfusion device and method. 4,648,384, Cl. 128-1.00D.

Schneider, Richard T.; and Keates, Richard H., to RTS Laboratories, Inc. Ophthalmic surgery system. 4,648,400, Cl. 128-303.100.

Scholl, Wolfgang: *See*—
Egner-Walter, Bruno; Neubauer, Walter; Schmid, Eckhardt; and Scholl, Wolfgang, 4,648,148, Cl. 15-250.210.

Scholz, Erhard: *See*—
Klupfel, Olaf; Frielinghaus, Walter S.; and Scholz, Erhard, 4,648,646, Cl. 294-106.000.

Scholz, Peter: *See*—
Ley, Hans; Neumock, Udo; Scholz, Peter; Seidler, Horst; Berghaus, Horst; and Schmidt, Manfred, 4,648,295, Cl. 82-18.000.

Schrauder, Franz: *See*—
Schuir, Alexander; and Schrauder, Franz, 4,648,184, Cl. 33-18.100.

Schroeder, James L., III: *See*—
Pass, Raymond V.; Schroeder, James L., III; and Ney, Reuben E., 4,648,681, Cl. 339-147.00R.

Schuh, Frank J.: *See*—
Biggs, Michael D.; and Schuh, Frank J., 4,648,469, Cl. 175-7.000.

Schuir, Alexander; and Schrauder, Franz, to F. Wieland Elektrische Industrie GmbH. Keyboard controlled apparatus for the identification of small parts. 4,648,184, Cl. 33-18.100.

Schultz, Lester W. Log lifter. 4,648,778, Cl. 414-626.000.

Schulz, Ronald N.: *See*—
Ogura, Seiki; Riseman, Jacob; Rovedo, Nivo; and Schulz, Ronald N., 4,648,937, Cl. 156-643.000.

Schutz, Joseph D., to Intel Corporation. Bootstrap buffer. 4,649,300, Cl. 307-482.000.

Schwab, Dieter: *See*—
Funghini, Augusto; Schwab, Dieter; and Springer, Helmut, 4,648,837, Cl. 432-122.000.

Schwane, Walter H.: *See*—
Hammer, William E.; Schwane, Walter H.; and Ziecina, Frederick J., 4,649,473, Cl. 364-200.000.

Schwarz, Werner: *See*—
Wiedemann, Kurt; and Schwarz, Werner, 4,648,784, Cl. 414-730.000.

Schweizer, Ernst: *See*—
Gallay, Jean-Jacques; and Schweizer, Ernst, 4,649,149, Cl. 514-367.000.

Schwengers, Dieter, to Pfeifer & Langen. Gluco-oligosaccharide mixture and a process for its manufacture. 4,649,058, Cl. 426-658.000.

Scientific Drilling International: *See*—
Moll, Helmut; and Ritchie, Roger E., 4,649,344, Cl. 324-221.000.

Scientific Pharmaceuticals, Inc.: *See*—
Orlowski, Jan A.; and Butler, David V., 4,648,845, Cl. 433-217.100.

SCM Corporation: *See*—
Canova, Levy A.; DePasquale, Ralph J.; and Wilson, Michael E., 4,649,063, Cl. 427-230.000.
DePasquale, Ralph J.; and Wilson, Michael E., 4,648,904, Cl. 106-2.000.

Scobie, William B.; and Wagberg, Michael L., to Keystone International, Inc. Fireproof valve assembly and valve element for use therein. 4,648,418, Cl. 137-67.000.

Scott, Darwin H.; and Wade, Kenneth D., to Reynolds Metals Company. Corrosion resistant aluminum brazing sheet. 4,649,087, Cl. 428-654.000.

Scott, Gerald R.: *See—*
Kowalski, Frank P.; and Scott, Gerald R., 4,648,389, Cl. 128-70.000.

Scott, Graham A., to General Electric Company. Rating plug for molded case circuit breaker. 4,649,455, Cl. 361-93.000.

Scott, Laurie J.; Erickson, Robert E.; and Wallace, Theodore C., to Dow Chemical Company, The. Foamed polymeric materials. 4,649,164, Cl. 521-149.000.

Scott, Paul C., to L Investments, Ltd. Adapter for circular saw to cut-off saw. 4,648,301, Cl. 83-464.000.

Scripps Clinic and Research Foundation: *See—*
Zimmerman, Theodore S.; and Fulcher, Carol A., 4,649,132, Cl. 514-12.000.

Scriptel Corporation: *See—*
Nakamura, Shiochiro; and Kable, Robert G., 4,649,232, Cl. 178-18.000.

Scruggs, David M.; and Mickelson, Eric N., to Dresser Industries, Inc. Apparatus for producing rapidly quenched metal particles. 4,648,820, Cl. 425-8.000.

Scrutchin, Thomas W., Jr.: *See—*
Martin, Mary S.; McCord, Elizabeth; Puckett, Harley D., Jr.; and Scrutchin, Thomas W., Jr., 4,649,513, Cl. 364-900.000.

Seegmiller, Henry L. B., to United States of America, National Aeronautics and Space Administration. Liquid seeding atomizer. 4,648,267, Cl. 73-147.000.

Seelbach, Walter C.: *See—*
McLaughlin, Kevin L.; and Seelbach, Walter C., 4,649,295, Cl. 307-446.000.

Seely, James R.; and Hillstrom, David U., to Marketing Displays, Inc. Method of mounting universal mounting bracket for gas pump toppers. 4,648,169, Cl. 29-526.00R.

Segawa, Hideo, to Ricoh Company, Ltd. Optical switch array. 4,648,686, Cl. 350-96.130.

Seidel, Dietrich: *See—*
Rosskopf, Gerhard; Seidel, Dietrich; and Wieland, Heinrich, 4,648,974, Cl. 210-651.000.

Seidler, Horst: *See—*
Ley, Hans; Neumock, Udo; Scholz, Peter; Seidler, Horst; Berghaus, Horst; and Schmidt, Manfred, 4,648,295, Cl. 82-18.000.

Seiko Epson Kabushiki Kaisha: *See—*
Oguchi, Koichi; Hosokawa, Minoru; Yazawa, Satoru; and Nagata, Mitsuo, 4,648,691, Cl. 350-338.000.

Seiko Koki Kabushiki Kaisha: *See—*
Nagaoka, Shinji, 4,648,700, Cl. 354-403.000.
Ogihara, Masuo; Oda, Hajime; Seki, Yoichi; and Yamazaki, Hiroshi, 4,648,701, Cl. 354-439.000.

Seiko Seiki Kabushiki Kaisha: *See—*
Nagata, Tetsuya, 4,648,213, Cl. 51-166.00R.

Seki, Yoichi: *See—*
Ogihara, Masuo; Oda, Hajime; Seki, Yoichi; and Yamazaki, Hiroshi, 4,648,701, Cl. 354-439.000.

Sekine, Hirokazu; Morimune, Katuhiko; Watanabe, Masaharu; and Suzuki, Nobuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Charge storage type semiconductor device and method for producing same. 4,649,408, Cl. 357-24.000.

Sekizuka, Yasuo: *See—*
Sumi, Naoki; Yamashita, Hiroshi; and Sekizuka, Yasuo, 4,649,052, Cl. 426-49.000.

Selkirk, Eric B.: *See—*
Bindner, Patrick E.; Selkirk, Eric B.; and Norton, Peter R., 4,649,336, Cl. 324-61.00R.

Selle, Robert W. Bench press safety platform with unloading shelf. 4,648,595, Cl. 272-123.000.

Seltzer, Raymond: *See—*
Ravichandran, Ramanathan; Malherbe, Roger F.; and Seltzer, Raymond, 4,649,221, Cl. 564-300.000.

Senior, Adrian: *See—*
Barry, Michael J.; Senior, Adrian; and Beech, Alan E., 4,649,288, Cl. 307-84.000.

Senmed, Inc.: *See—*
Fox, William D.; and Mereness, William M., 4,648,542, Cl. 227-19.000.

Seroussi, Henry I. Nargile - oriental tobacco water pipe for smoking cured tobaccos. 4,648,410, Cl. 131-173.000.

Seto, Haruo: *See—*
Otake, Noboru; Seto, Haruo; Sasaki, Tetsuo; Sugita, Masanori; and Hiramoto, Shigeru, 4,649,135, Cl. 514-183.000.

Setzer, Ronald P.: *See—*
Burgers, John; and Setzer, Ronald P., 4,648,344, Cl. 114-222.000.

SGS-ATES Componenti Elettronici S.p.A.: *See—*
Marchisi, Giuseppe; and De Martiis, Carlo C., 4,649,460, Cl. 361-386.000.

Shanabruch, William G.: *See—*
Sinskey, Anthony J.; Walker, Graham C.; Higashio, Kanji; Rao, Eswara A.; Shanabruch, William G.; and Yoshihama, Makoto, 4,649,119, Cl. 435-317.000.

Shannon, Thomas G.: *See—*
Kosky, Philip G.; Silva, James M.; Brunelle, Daniel J.; and Shannon, Thomas G., 4,649,210, Cl. 558-265.000.

Shanzer, Abraham; and Samuel, David, to Yeda Research and Development Company Ltd. Lipophilic lithium ionophores. 4,649,218, Cl. 564-197.000.

Shapiro, Edward. Quickly resettable timer. 4,648,721, Cl. 368-93.000.

Sharp Kabushiki Kaisha: *See—*
Furubayashi, Hisatoshi; Tabuchi, Hiroki; and Hijikigawa, Masaya, 4,649,365, Cl. 338-25.000.
Iwai, Hiroji; and Yamaji, Koji, 4,648,731, Cl. 400-240.100.
Takeda, Makoto; Nonomura, Keisaku; and Funada, Fumiaki, 4,649,383, Cl. 340-805.000.

Shaskan, Paul: *See—*
De Luca, Paul V.; Shaskan, Paul; and Belle-Oudry, Michael, 4,649,456, Cl. 361-119.000.

Shatzkin, Michael: *See—*
De Luca, Paul V.; Atun, Albert; and Shatzkin, Michael, 4,649,236, Cl. 379-327.000.

Shea, John W.: *See—*
Kordich, Michael M.; and Shea, John W., 4,648,461, Cl. 169-60.000.

Shea, Richard J.: *See—*
Lima, Joseph V.; and Shea, Richard J., 4,648,850, Cl. 445-22.000.

Sheafor, Stephen J.; and Weng, Ken K. S., to Dialogic Systems Corp. Method and apparatus for fault tolerant serial communication of digital information. 4,649,384, Cl. 340-825.030.

Shearer, Wanda: *See—*
Sutton, Jimmy; Shearer, Wanda; Arkin, Karlie J.; Spoelstra, Jeffrey A.; Weiss, Steven M.; Ramsey, Sherry L.; Hurlbut, Kyle; Culbertson, W. Bruce; and Burns, Robert R., 4,649,499, Cl. 364-518.000.

Sheets, Ronald E., to Tamarack Scientific Co., Inc. Apparatus for heating semiconductor wafers in order to achieve annealing, silicide formation, reflow of glass passivation layers, etc. 4,649,261, Cl. 219-390.000.

Sheller Globe Corporation: *See—*
Reilly, Albert F.; and Sanok, John L., 4,648,832, Cl. 425-543.000.

Shen, Fung-Win: *See—*
Safai, Bijan; Boyse, Edward A.; and Shen, Fung-Win, 4,649,115, Cl. 435-240.000.

Sheriff, David R., to Xerox Corporation. Floating collet suspension for floppy disk drives. 4,649,445, Cl. 360-99.000.

Sherman, Daniel A. Elongated baffled tunnel opening for a rodent tamper-resistant bait station. 4,648,201, Cl. 43-131.000.

Sherwood Medical Company: *See—*
Agdanowski, Ronald T.; Geil, James A.; and Tatro, Bernard J., 4,648,398, Cl. 128-207.180.

Shiba, Kiminori: *See—*
Watanabe, Kenshu; Shiba, Kiminori; Arai, Mikiya; Yamaguchi, Masaya; Fujiki, Yasuo; and Fujimoto, Ryohei, 4,648,480, Cl. 181-158.000.

Shibasaki, Jun, to Toyoda Gosei Co., Ltd. Glass run for automobile door. 4,648,207, Cl. 49-441.000.

Shibasaki, Sohei; Iwasaki, Yasumasa; Ono, Noriki; Arai, Koichi; Maruyama, Koji; and Shimanari, Tatsumi, to Casio Computer Company, Ltd.; and Casio Electronics Manufacturing Company, Ltd. Image reproduction apparatus. 4,648,706, Cl. 355-43.000.

Shibata, Kizo; and Dodo, Kazuo, to Mitsubishi Plastics Industries, Limited. Process for producing a heat-shrinkable polypropylene film. 4,649,009, Cl. 264-235.800.

Shibata, Takanori: *See—*
Yoshikawa, Toshiharu; and Shibata, Takanori, 4,649,184, Cl. 526-279.000.

Shibuya, Toshifumi: *See—*
Nishimura, Keizo; Kobayashi, Masaharu; Okamoto, Hiroo; Noguchi, Takaharu; Arai, Takao; and Shibuya, Toshifumi, 4,649,542, Cl. 371-39.000.

Shielddalloy Corporation: *See—*
Murray, Peter; and Slinn, David, 4,648,901, Cl. 75-68.00R.

Shiga, Tatsuhide: *See—*
Doki, Yoshikuni; Fujiwara, Masatoshi; Shiga, Tatsuhide; Shono, Yohsuke; Tanaka, Mikio; and Tsuruoka, Yoshihiro, 4,649,359, Cl. 335-222.000.

Shigesada, Masaaki; and Kazama, Norio, to Nissan Motor Co., Ltd. Removably pivoted rear parcel shelf for hatchback type vehicle. 4,648,648, Cl. 296-37.160.

Shiibayashi, Masao, to Hitachi, Ltd. Scroll fluid machine with oil injection part and oil relieving passage. 4,648,814, Cl. 418-55.000.

Shilo, Moshe; and Fattom, Ali, to Solmat Systems, Ltd. Polymeric substance, and method of separating and culturing bacteria to provide polymeric substance useful in liquid clarification and soil conditioning. 4,649,110, Cl. 435-68.000.

Shimamura, Akira: *See—*
Abe, Kazuo; and Shimamura, Akira, 4,648,828, Cl. 425-288.000.

Shimanari, Tatsumi: *See—*
Shibasaki, Sohei; Iwasaki, Yasumasa; Ono, Noriki; Arai, Koichi; Maruyama, Koji; and Shimanari, Tatsumi, 4,648,706, Cl. 355-43.000.

Shimano Industrial Company Limited: *See—*
Furomoto, Yoshiyuki, 4,648,566, Cl. 242-213.000.

Shimata, Makoto: *See—*
Asano, Kazuhiko; Takezoe, Osamu; Yasuda, Yoshinori; Hayashi, Kenji; Aoki, Masanobu; Doi, Yoshio; and Shimata, Makoto, 4,648,918, Cl. 148-439.000.

Shimirak, Gerald L.: *See—*
Diaz, Stephen H.; Debbaut, Christian A. M.; Humphries, William H.; Lawrence, Alvah A.; Ragland, Glen W.; and Shimirak, Gerald L., 4,648,919, Cl. 156-48.000.

Shimizu, Kyoichi; and Fujita, Akira, to Victor Company of Japan, Ltd. Phase locked signal generator. 4,649,438, Cl. 358-337.000.

Shimomura, Setsuhiro: *See—*
Wada, Shunichi; Shimomura, Setsuhiro; Kumagai, Naotake; Takizawa, Shozo; Maruyama, Mitsunori; Tatemoto, Minoru; Takada, Hiroyuki; and Harara, Mitsuhiko, 4,648,622, Cl. 280-707.000.

Shimura, Takaki: *See—*
Klepper, John R.; Reid, John M.; Miwa, Hirohide; Shimura, Takaki; and Murakami, Keiichi, 4,648,276, Cl. 73-599.000.
Shin-Etsu Chemical Co., Ltd.: *See—*
Takamizawa, Minoru; Yamamoto, Akira; Ishihara, Toshinobu; and Nagura, Shigehiro, 4,649,185, Cl. 526-279.000.
Shin, Sang J. Box with removable decorative figures. 4,648,548, Cl. 229-8.000.
Shingawa Daikasuto Kogyo Kabushiki Kaisha: *See—*
Araki, Satoru, 4,648,998, Cl. 261-34.200.
Shinoda, Hirotaka: *See—*
Irikura, Tsutomu; Suzue, Seigo; Uchida, Hiroaki; Shinoda, Hirotaka; Murayama, Satoshi; and Kinoshita, Susumu, 4,649,198, Cl. 544-281.000.
Shinozaki, Takashi; and Ishikawa, Satoshi, to Honda Giken Kogyo Kabushiki Kaisha. Air cleaner system for motorcycles. 4,648,474, Cl. 180-219.000.
Shionogi & Co., Ltd.: *See—*
Hayase, Yoshio; Morita, Koichi; Ide, Kinya; and Takahashi, Toshio, 4,648,898, Cl. 71-93.000.
Shirai, Akira: *See—*
Nomura, Yoshihisa; Ishikawa, Masakazu; Shirai, Akira; Nogami, Takahiro; Nakamura, Kazumasa; and Ohashi, Kaoru, 4,648,663, Cl. 303-106.000.
Shirey, Richard: *See—*
Mieyal, David F.; Shirey, Richard; and Worley, Robert F., 4,648,230, Cl. 52-667.000.
Shivarov, Georgi S.: *See—*
Savov, Svetoslav A.; Mintchev, Mintcho S.; Nitchev, Peter T.; and Shivarov, Georgi S., 4,648,952, Cl. 204-192.120.
Shoji, Masakazu, to AT&T Bell Laboratories. Synthetic CMOS static logic gates. 4,649,296, Cl. 307-451.000.
Shono, Masahiro, to Sanyo Electric Co., Ltd. Dual operating mode switching power supply. 4,649,464, Cl. 363-21.000.
Shono, Yohsuke: *See—*
Doki, Yoshikuni; Fujiwara, Masatoshi; Shiga, Tatsuhide; Shono, Yohsuke; Tanaka, Mikio; and Tsuruoka, Yoshihiro, 4,649,359, Cl. 335-222.000.
Shorey, Thomas H.: *See—*
Abdelmaseh, Michael E.; and Shorey, Thomas H., 4,648,570, Cl. 244-118.100.
Shulan, John L.: *See—*
Rolle, Thomas E.; Nebel, David J.; Shulan, John L.; and Liljestrom, William P., 4,648,560, Cl. 241-24.000.
Shurgan, Joel, to Duro-Test Corporation. Gas discharge lamp starter. 4,649,319, Cl. 315-99.000.
Sibigtroth, James M., to Motorola, Inc. Microcomputer having an internal address mapper. 4,649,476, Cl. 364-200.000.
Siddens, Jack K.: *See—*
Addor, Roger W.; Wright, Donald P., Jr.; Siddens, Jack K.; and Hand, John J., 4,649,148, Cl. 514-321.000.
Siebert, Rainer: *See—*
Furst, Wilhelm; Rudenauer, Werner; and Siebert, Rainer, 4,648,320, Cl. 102-210.000.
Siegel, William G.: *See—*
DeLuca, Michael J.; and Siegel, William G., 4,649,538, Cl. 371-25.000.
Siegfried, Knecht, to Maschinenfabrik Alfred Schmermund GmbH & Co. Apparatus for cutting off a tear-open strip. 4,648,299, Cl. 83-150.000.
Siegfried, Rand, to Lewis Galoob Toys, Inc. Wheel hub locking mechanism. 4,648,853, Cl. 446-448.000.
Siemens Aktiengesellschaft: *See—*
Brunn, Klaus; and Polster, Walter, 4,649,558, Cl. 378-97.000.
Engan, Helge, 4,649,509, Cl. 364-821.000.
Forster, Alfred; Riss, Helmut; and Walker, Heinz, 4,649,527, Cl. 367-108.000.
Horn, Gunther; Pieper, Wolfgang; and Roeser, Heribert, 4,649,361, Cl. 336-192.000.
Jans, Herbert, 4,649,234, Cl. 379-138.000.
Preuss, Bernhard; and Manthe, Karl-Heinz, 4,649,247, Cl. 200-244.000.
Schmid, Rudolf, 4,649,546, Cl. 372-61.000.
Siemens-Allis, Inc.: *See—*
Young, John W.; Luke, Roger D.; Rhodes, Henry J.; and Hudgins, Jeffrey K., 4,649,241, Cl. 200-82.00R.
Siemens Energy & Automation, Inc.: *See—*
Kralik, Andrew J., 4,649,242, Cl. 200-147.00R.
Siemens Gammasonics, Inc.: *See—*
Persyk, Dennis E., 4,649,268, Cl. 250-207.000.
Persyk, Dennis E., 4,649,269, Cl. 250-207.000.
SIG Schweizerische Industrie-Gesellschaft: *See—*
Knecht, Alfred, 4,648,236, Cl. 53-234.000.
Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.: *See—*
Fanelli, Ottorino, 4,649,159, Cl. 514-556.000.
Signetics Corporation: *See—*
Blauschild, Robert A., 4,649,352, Cl. 330-261.000.
Kolluri, Madhavprasad V., 4,649,371, Cl. 340-347.0AD.
Sijbers, Peter J. M., to U.S. Philips Corporation. Telephone circuit with a class-B amplifier output stage. 4,649,235, Cl. 379-348.000.
Sikora, Scott T., to Tomar Electronics, Inc. Automatic control system for a releasable vehicle locking device. 4,648,781, Cl. 414-401.000.
Silva, James M.: *See—*
Kosky, Philip G.; Silva, James M.; Brunelle, Daniel J.; and Shannon, Thomas G., 4,649,210, Cl. 558-265.000.
Silverstein, Seth D.: *See—*
Zinser, Richard L., Jr.; Silverstein, Seth D.; and Koch, Steven R., 4,649,505, Cl. 379-411.000.
Siman, Jaime E., to Westinghouse Electric Corp. Magnetic core and methods of consolidating same. 4,648,929, Cl. 156-188.000.
Simmons, Lois M. Massage implement. 4,648,387, Cl. 128-57.000.
Simonet, Guy: *See—*
Van Wijnendaele, Frans; and Simonet, Guy, 4,649,192, Cl. 530-371.000.
Sindlinger, Raimund: *See—*
Thiel, Klaus P.; Sindlinger, Raimund; and Merrem, Hans J., 4,649,101, Cl. 430-326.000.
Sinha, Susanta; Brown, Philip S.; Harman, Douglas G.; Keller, Harold T.; Olechovsky, David F.; and Cheng, Wenche W., to Westinghouse Electric Corp. Tube expansion process. 4,649,492, Cl. 364-472.000.
Sinha, Susanta: *See—*
Castner, Raymond P.; Olechovsky, David F.; Brown, Philip S.; Sinha, Susanta; Keller, Harold T.; and Cheng, Wenche W., 4,649,493, Cl. 364-472.000.
Sinisi, David B., to AMP Incorporated. Zero insertion force card edge connector. 4,648,668, Cl. 339-74.00R.
Sinskey, Anthony J.; Walker, Graham C.; Higashio, Kanji; Rao, Eswara A.; Shanabruch, William G.; and Yoshihama, Makoto, to Massachusetts Institute of Technology. Cloning systems for corynebacterium. 4,649,119, Cl. 435-317.000.
Sireix, Georges. Apparatus for applying a sealing material to the edge of a length of packaging. 4,648,859, Cl. 493-105.000.
Sirris Flow Technology, Inc.: *See—*
Johnson, Carl A.; and Robinson, S. M. Boris, 4,648,270, Cl. 73-202.000.
Skarstedt, Mark T.: *See—*
Ismail, Ibrahim A.; Hemmes, Paul; Skarstedt, Mark T.; and Zipp, Adam, 4,649,121, Cl. 436-14.000.
SKF Compagnie d'Applications Mechaniques: *See—*
Jacquot, Alain; and Charpentier, Jacques, 4,648,294, Cl. 82-4.00R.
Skinner, Daniel S., Jr.: *See—*
Davis, Robert C.; Gibson, John W.; Skinner, Daniel S., Jr.; Dearth, Timothy E.; and Harris, Dale C., 4,649,042, Cl. 424-438.000.
Skold, Bo P.: *See—*
Jungnell, Jarl O.; and Skold, Bo P., 4,648,619, Cl. 280-650.000.
Skyba, Helmut K. Cam lock. 4,648,483, Cl. 182-187.000.
Slinn, David: *See—*
Murray, Peter; and Slinn, David, 4,648,901, Cl. 75-68.00R.
Sloan-Kettering Institute: *See—*
Safai, Bijan; Boyse, Edward A.; and Shen, Fung-Win, 4,649,115, Cl. 435-240.000.
Sloan Valve Company: *See—*
Schmitt, Eugene W.; and Campbell, Robert E., 4,648,661, Cl. 303-23.00R.
Slosiarek, Michael L.; and Wagner, Robert J., to Deutz-Allis Corporation. Downwardly swinging replaceable air filter for a vehicle cab. 4,648,311, Cl. 98-2.110.
Smialkowski, Zozislaus. Applicator for dispensing fluids. 4,648,732, Cl. 401-196.000.
Smith, Alan; and Patel, Bhupendra, to 501 Hollingsworth (U.K.) Ltd. Transport conveyor for conical object. 4,648,502, Cl. 198-399.000.
Smith, Charles A.: *See—*
Poppelsdorf, Fedor; and Smith, Charles A., 4,649,226, Cl. 568-864.000.
Smith, Kenneth J. Upper denture attachment means. 4,648,841, Cl. 433-173.000.
Smith Kline & French Laboratories Limited: *See—*
Brown, Thomas H.; and Ife, Robert J., 4,649,141, Cl. 514-272.000.
Smith Kline-RIT: *See—*
Van Wijnendaele, Frans; and Simonet, Guy, 4,649,192, Cl. 530-371.000.
Smith-Migatz, Dena: *See—*
Rosenberg, Ruth, 4,648,851, Cl. 446-372.000.
Smith, Peter B., to Black & Decker, Inc. Low-cost, keyless chuck and method of manufacture. 4,648,608, Cl. 279-1.00K.
Smith, R. Leon. Weighted heeling rope. 4,648,352, Cl. 119-153.000.
Smith, Stephen W.: *See—*
Lessig, William R., III; Wheeler, Dale K.; Bailey, R. Roby, Jr.; and Smith, Stephen W., 4,649,245, Cl. 200-157.000.
Smith, William L.; and Munk, Barbara H., to Clorox Company, The. Thickened aqueous prewash composition. 4,648,987, Cl. 252-559.000.
SmithKline & French Laboratories Limited: *See—*
Durant, Graham J.; Ganellin, Charon R.; and Vickers, Margaret R., 4,649,138, Cl. 514-232.000.
SMS Schloemann-Siemag Aktiengesellschaft: *See—*
Berz, Gerhard; Braun, Hans J.; and Schlanzke, Claus G., 4,648,770, Cl. 414-30.000.
Snam S.p.A.: *See—*
Vinciguerra, Constantino; and Bonfiglioli, Giampaolo, 4,648,626, Cl. 285-15.000.
Snavely, Earl S., Jr.; and Jones, Timothy A., to Mobil Oil Corporation. Process for the selective removal of hydrogen sulfide from gaseous streams. 4,649,032, Cl. 423-226.000.
Snellgrove, Timothy R.: *See—*
Morritt, Graham N.; Paes, Malvolio L.; Conacher, Ian D.; Gutridge, John R.; and Snellgrove, Timothy R., 4,648,386, Cl. 128-4.000.
SnyderGeneral Corporation: *See—*
Redington, Gordon F., 4,648,854, Cl. 474-114.000.

Societe Generale d'Etudes et de Materiels Industriels Navals et Informatiques: *See*—
Cartier, Claude J.; Guilhem, Jean R. R.; Guilhem, Jacques R. J.; and Wenger, Roger L. L., 4,648,392, Cl. 128-160.000.
Societe Nationale d'Etude et de Construction de Meteur d'Aviation "S.N.E.C.M.A." : *See*—
Lardellier, Alain M. J., 4,648,795, Cl. 415-196.000.
Societe Paris-Rhone: *See*—
Mazzorana, Alfred B.; and Froment, Francis, 4,649,285, Cl. 290-48.000.
Sokol, Steve, to Detroit Bracket Co., Inc. Bracket for supporting a radar detector or like device. 4,648,572, Cl. 248-206.200.
Solmat Systems, Ltd.: *See*—
Shilo, Moshe; and Fattom, Ali, 4,649,110, Cl. 435-68.000.
Solvay & Cie: *See*—
Delbouille, Andre ; and Derroitte, Jean-Louis, 4,649,182, Cl. 526-125.000.
Solymos, Andras: *See*—
Matyas, Bela; Gerber, Pal; Solymos, Andras; Kaszanitzky, Ferenc; Panto, Gyorgy; and Leffler, Janos, 4,649,031, Cl. 423-20.000.
Sonnenberg, John R., to Motorola, Inc. Frequency synthesizer modulation response linearization. 4,649,353, Cl. 331-8.000.
Sony Corporation: *See*—
Abe, Miki; and Suzuki, Tadao, 4,649,372, Cl. 340-347.0NT.
Iwasawa, Susumu, 4,649,453, Cl. 360-137.000.
Kikuchi, Masahiro; Kobori, Yuzuru; and Murakami, Kanemitsu, 4,649,318, Cl. 313-449.000.
Watanabe, Yuji; and Endoh, Yasuyuki, 4,649,432, Cl. 358-241.000.
Sophisticated Signals and Circuits: *See*—
Halpern, Peter H.; Mallory, Peter E.; Haug, Paul E.; and Koos, William M., Jr., 4,649,549, Cl. 380-32.000.
Spangler, William F.: *See*—
Beckerer, Frank S., Jr.; and Spangler, William F., 4,648,435, Cl. 160-92.000.
Spanner, Raymond A.: *See*—
Martin, David H.; and Spanner, Raymond A., 4,649,382, Cl. 340-785.000.
Spease, Arthur L.: *See*—
Bennett, William G.; and Spease, Arthur L., 4,649,010, Cl. 264-242.000.
Speca, Anthony N.: *See*—
Rekers, Louis J.; Speca, Anthony N.; and Mayhew, Harry W., 4,649,128, Cl. 502-109.000.
Spector, Donald. Strength/weight measuring scale. 4,648,272, Cl. 73-380.000.
Spectra-Physics, Inc.: *See*—
Carlson, Lee R.; Hegedus, Denes A.; Jarrett, Steven M.; Miller, Michael F.; Riley, Martin E.; and Wright, David L., 4,649,547, Cl. 372-61.000.
Spectrascan, Inc.: *See*—
Hoigaard, Jan C., 4,649,374, Cl. 340-573.000.
Sperber, Henry. Process for manufacturing batt-type insulation from loose fibrous particles. 4,648,920, Cl. 156-62.200.
Sperry Corporation: *See*—
Johnson, Michael J.; and Hancock, William R., 4,649,378, Cl. 340-728.000.
Scheuneman, James H., 4,649,475, Cl. 364-200.000.
Spiess, Andreas: *See*—
Keller, Guido; Spiess, Andreas; Ott, Hans; and Boegli, Rolf, 4,649,502, Cl. 364-519.000.
Spinosa, Dominic J.; and Knoll, Frank, to East/West Industries. Closure device for high pressure packaging. 4,648,160, Cl. 24-515.000.
Spiromec AB: *See*—
Strongert, Lars H.; and Lindgren, Sten O. T., 4,648,431, Cl. 141-18.000.
Spoelstra, Jeffrey A.: *See*—
Sutton, Jimmy; Shearer, Wanda; Arkin, Karlie J.; Spoelstra, Jeffrey A.; Weiss, Steven M.; Ramsey, Sherry L.; Hurlbut, Kyle; Culbertson, W. Bruce; and Burns, Robert R., 4,649,499, Cl. 364-518.000.
Springen, Nancy L.: *See*—
Advani, Hira; Loucks, Larry K.; and Springen, Nancy L., 4,649,479, Cl. 364-300.000.
Springer, Helmut: *See*—
Funghini, Augusto; Schwab, Dieter; and Springer, Helmut, 4,648,837, Cl. 432-122.000.
Staheli, Paul; Stahli, Urs; and Knabenhaus, Fritz, to Maschinenfabrik Rieter A.G. Arrangement for transporting fiber flocks. 4,648,754, Cl. 406-156.000.
Stahli, Urs: *See*—
Staheli, Paul; Stahli, Urs; and Knabenhaus, Fritz, 4,648,754, Cl. 406-156.000.
Stainton, John E.: *See*—
Dunkley, Michael W.; and Stainton, John E., 4,648,290, Cl. 74-866.000.
Stamicarbon B.V.: *See*—
Castelijns, Anna M. C. F.; and Aarts, Thomas M. G., 4,649,211, Cl. 558-430.000.
Stanaback, Robert J.: *See*—
Hays, Byron G.; and Stanaback, Robert J., 4,648,907, Cl. 106-30.000.
Standard Oil Company (Indiana): *See*—
Edwards, Robert C.; and Udovich, Carl A., 4,649,205, Cl. 549-260.000.
Strock, Dennis J., 4,648,523, Cl. 220-20.500.
Standex International Corporation: *See*—
Kowalski, Frank P.; and Scott, Gerald R., 4,648,389, Cl. 128-70.000.
Stanescu, Mircea S.; Weinstein, David J.; and Cornelssen, Cornelius W., to BOC Group, Inc., The. Process for annealing ferrous wire. 4,648,914, Cl. 148-16.000.
Starichnev, Vladimir V.: *See*—
Masovich, Felix Z.; and Starichnev, Vladimir V., 4,648,659, Cl. 299-1.000.
Starr, James B., to Honeywell Inc. Sensor. 4,649,363, Cl. 338-4.000.
Stashko, Daniel R., to GTE Valeron Corporation. Multiple insert end mill. 4,648,755, Cl. 407-36.000.
Stauffer Chemical Company: *See*—
Brock, David G.; and Baumann, John A., 4,649,024, Cl. 427-82.000.
Gray, Reed A.; and Hyazk, Daniel L., 4,648,894, Cl. 71-87.000.
Steag AG: *See*—
Thelen, Franz, 4,648,331, Cl. 110-342.000.
Stefany, James H.: *See*—
Holder, Clinton H., Jr.; Kirsch, Howard C.; and Stefany, James H., 4,649,523, Cl. 365-203.000.
Steffee, Arthur D., to AcroMed Corporation. Apparatus and method for maintaining vertebrae in a desired relationship. 4,648,388, Cl. 128-69.000.
Steffen, Hans; and Ferro, Alberto, to Hoffmann-La Roche Inc. Injectable solutions. 4,649,155, Cl. 514-458.000.
Steger, John J.: *See*—
Poeppelmeier, Kenneth R.; Funk, Walter G.; Steger, John J.; Fung, Shun C.; Cross, Virginia R.; and Kao, Jar-Lin, 4,648,960, Cl. 208-138.000.
Steidel, Leonard R. Size independent modular web processing line and modules. 4,648,540, Cl. 226-111.000.
Stein Industrie: *See*—
Couarc'h, Michel F. E.; Bessouat, Roger; Lafaye, Marc R. R.; and Bernet, Robert R. E., 4,648,329, Cl. 110-245.000.
Steinberger, Josef: *See*—
Kempken, Rainer; Steinberger, Josef; and Ritschel, Johann, 4,648,170, Cl. 29-568.000.
Steinhilber, Helmut: *See*—
Paulat, Klaus, 4,648,590, Cl. 271-272.000.
Steinmetz, Guy R.: *See*—
Rule, Mark; Larkins, Thomas H., Jr.; Lane, Donald W.; and Steinmetz, Guy R., 4,649,216, Cl. 562-406.000.
Stemmler, Kurt; and Blumle, Martin, to Winkler+Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. KG. Article turning device. 4,648,503, Cl. 198-410.000.
Stephan, Peter, to Bergwerksverband GmbH. Rock-bolt stabilizer device for mining and tunneling applications. 4,648,753, Cl. 405-260.000.
Stephenson, David G.: *See*—
Greider, C. Austin; Stephenson, David G.; Lee, Terry R.; and Durfee, John R., 4,648,238, Cl. 56-202.000.
Stephenson, Dwight B.; and Wendel, Glenn R., to Deere & Company. Control circuit and control valve for radial piston pump. 4,648,803, Cl. 417-53.000.
Steuer, Dagmar; and Schmidtberger, Rudolf, to Behringwerke Aktiengesellschaft. Process for reducing turbidity in control sera. 4,649,120, Cl. 436-13.000.
Stewart, D. Fred: *See*—
Oliver, Dickon T.; and Stewart, D. Fred, 4,648,257, Cl. 72-16.000.
Stewart, Eric C., to United States of America, National Aeronautics and Space Administration. Airplane automatic control force trimming device for asymmetric engine failures. 4,648,569, Cl. 244-76.00R.
Stewart, Iain G.: *See*—
Brinker, Alfred; Stewart, Iain G.; and Dreyer, Uwe, 4,648,232, Cl. 53-54.000.
Stichting "Stichting Waterbouwkundig Laboratorium" : *See*—
Hulsbergen, Cornelis H., 4,648,745, Cl. 405-159.000.
Stirling, William. Round bale handler. 4,648,769, Cl. 414-24.600.
Stock, Norman A.: *See*—
Malashenko, Alexander; and Stock, Norman A., 4,648,943, Cl. 162-300.000.
Stockburger, Hermann; and Bauer, Siegfried, to Copytex GmbH Sicherheitssysteme. Method for protection against the re-transfer of uniquely recorded information on a data carrier and apparatus for recording and/or reading re-transfer-protected information. 4,649,265, Cl. 235-380.000.
Stokes, Darryll. Mounting ring assembly for a toilet bowl. 4,648,139, Cl. 4-252.00R.
Stokley, Charles O.: *See*—
Sanford, Lawrence; Stokley, Charles O.; and Turner, Edwin C., 4,648,448, Cl. 166-187.000.
Story, Alfred D., to Teepak, Inc. Shirred tubular material. 4,648,428, Cl. 138-118.100.
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Walterdorf, Klaus P.; and Hansson, Volker, 4,649,018, Cl. 376-272.000.
Strange, Andrew: *See*—
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Streckenbach, Wulf-Christian: *See*—
Sander, Hans-Dieter; and Streckenbach, Wulf-Christian, 4,649,551, Cl. 375-81.000.
Strecker, Dennis C. Tainter gate system. 4,648,742, Cl. 405-100.000.
Strilchuk, Andrew R.: *See*—
Nagra, Surjit S.; and Strilchuk, Andrew R., 4,648,453, Cl. 166-281.000.

Strock, Dennis J., to Standard Oil Company (Indiana). Underground tank assembly with internal bladder. 4,648,523, Cl. 220-20.500.

Strongert, Lars H.; and Lindgren, Sten O. T., to Spiromec AB. Hand controlled filling valve for filling containers with gaseous medium. 4,648,431, Cl. 141-18.000.

Stucker, Harold L., to General Electric Company. Phase lag adjustment in electric meter. 4,649,337, Cl. 324-138.000.

Stull, Gene. Cap and means for retaining cap liner. 4,648,520, Cl. 215-350.000.

Stupp, Edward H.: *See*—
Marshall, Thomas; and Stupp, Edward H., 4,648,956, Cl. 204-299.0EC.

Suerken, Hans P.; Amort, Jurgen; Hanisch, Horst; and van der Maas, Hendrikus, to Dynamit Nobel AG. Method for performing organic reactions in silicone oils. 4,649,220, Cl. 564-296.000.

Suganuma, Nobuo: *See*—
Gomi, Tetsuo; Suganuma, Nobuo; Ishii, Kazuo; and Sato, Hiroshi, 4,649,044, Cl. 424-49.000.

Sugimoto, Hitoshi: *See*—
Kayakabe, Nobuhiro; Sugiura, Tadashi; and Sugimoto, Hitoshi, 4,648,163, Cl. 29-159.00R.

Sugimoto, Takeshi: *See*—
Nohara, Shigezo; Sugimoto, Takeshi; Sakano, Kozaburo; Ohkubo, Yoshimichi; and Matsuo, Junichi, 4,649,004, Cl. 264-85.000.

Sugishita, Susumu: *See*—
Sakamaki, Hiroshi; Sugishita, Susumu; Horikoshi, Yukio; and Yanagihashi, Kikuji, 4,648,818, Cl. 418-173.000.
Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, 4,648,819, Cl. 418-173.000.

Sugita, Masanori: *See*—
Otake, Noboru; Seto, Haruo; Sasaki, Tetsuo; Sugita, Masanori; and Hiramoto, Shigeru, 4,649,135, Cl. 514-183.000.

Sugiura, Tadashi: *See*—
Kayakabe, Nobuhiro; Sugiura, Tadashi; and Sugimoto, Hitoshi, 4,648,163, Cl. 29-159.00R.

Sugiyama, Sadao; and Goto, Hiroshi, to Omron Tateisi Electronics Co. Static pressure air surface stage. 4,648,723, Cl. 384-9.000.

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Endo, Takayoshi; Sugiyama, Toshimasa; Murofushi, Satoru; and Yagi, Sakai, 4,648,673, Cl. 339-97.00R.

Sukegawa, Tsuneyuki: *See*—
Kondo, Kazuo; and Sukegawa, Tsuneyuki, 4,649,070, Cl. 428-209.000.

Sullivan Engine Works, Inc.: *See*—
Sullivan, Robert W.; Holder, Tommie J.; and Buchanan, Max F., 4,648,358, Cl. 123-43.00A.

Sullivan, James W.: *See*—
Lewis, Robert T.; Sullivan, James W.; Milliner, Kenneth M.; and Lowe, Byron L., 4,648,858, Cl. 493-4.000.

Sullivan, Paul A.: *See*—
Metz, Werner A., Jr.; Szluk, Nicholas J.; Miller, Gayle W.; Drury, Michael J.; and Sullivan, Paul A., 4,648,175, Cl. 29-589.000.

Sullivan, Robert W.; Holder, Tommie J.; and Buchanan, Max F., to Sullivan Engine Works, Inc. Rotary vee engine. 4,648,358, Cl. 123-43.00A.

Sulzer Brothers Limited: *See*—
Juhling, Dieter, 4,648,635, Cl. 285-361.000.

Sumi, Naoki; Yamashita, Hiroshi; and Sekizuka, Yasuo, to Meiji Seika Kaisha, Ltd. Method for production of garlic paste. 4,649,052, Cl. 426-49.000.

Suminoe Textile Co., Ltd.: *See*—
Yabe, Tomoyoshi, 4,648,250, Cl. 68-5.00D.

Sumitomo Chemical Company, Limited: *See*—
Hashimoto, Tadanori; Hama, Masaaki; and Kobayashi, Osamu, 4,649,003, Cl. 264-63.000.

Sumitomo Heavy Industries, Ltd.: *See*—
Noda, Takaaki; and Terai, Hiroshi, 4,648,887, Cl. 55-2.000.

Sun, Shu S.; and Laumann, Curt W., to International Business Machines Corporation. Self biasing thermal magneto-optic medium. 4,649,519, Cl. 365-122.000.

Sunbeam Plastics Corporation: *See*—
Kennedy, Kenneth R., 4,648,519, Cl. 215-261.000.

Sundheimer, Patrick: *See*—
Holcblat, Alain H.; Sundheimer, Patrick; and Pascal, Yves, 4,648,354, Cl. 122-32.000.

Sundstrand Corporation: *See*—
Heitz, Steven A.; and Dobbs, Daniel R., 4,648,322, Cl. 102-411.000.

Sung, Eric: *See*—
Krause, Horst-Jurgen; Syldatk, Andreas; and Sung, Eric, 4,648,984, Cl. 252-174.220.

Sunpower, Inc.: *See*—
Berchowitz, David M.; and Redlich, Robert W., 4,649,283, Cl. 290-1.00R.

Suntory Limited: *See*—
Tanaka, Hideo; Ohhashi, Kuniyoshi; Gomi, Tatsuya; and Dobashi, Tomoyuki, 4,649,054, Cl. 426-397.000.

Sutton, David W., to Hero Automation. In-line shearing device. 4,648,298, Cl. 83-62.000.

Sutton, Jimmy; Shearer, Wanda; Arkin, Karlie J.; Spoelstra, Jeffrey A.; Weiss, Steven M.; Ramsey, Sherry L.; Hurlbut, Kyle; Culbertson, W. Bruce; and Burns, Robert R., to Hewlett-Packard Company. Touch-screen two-dimensional emulation of three-dimensional objects. 4,649,499, Cl. 364-518.000.

Suzue, Seigo: *See*—
Irikura, Tsutomu; Suzue, Seigo; Uchida, Hiroaki; Shinoda, Hirotaka; Murayama, Satoshi; and Kinoshita, Susumu, 4,649,198, Cl. 544-281.000.

Suzuki, Arata, to Capintec, Inc. High-energy radiation detector and method of detection. 4,649,276, Cl. 250-361.00R.

Suzuki, Hiromasa: *See*—
Kasahara, Yasushi; Ashihara, Yoshihiro; and Suzuki, Hiromasa, 4,649,105, Cl. 435-5.000.

Suzuki, Hirosuke, to Junkosha Co., Ltd. Transmission line. 4,649,228, Cl. 174-36.000.

Suzuki Jidosha Kogyo Kabushiki Kaisha: *See*—
Kaneta, Keisuke, 4,648,371, Cl. 123-492.000.

Suzuki, Keitaro: *See*—
Ikenoue, Yutaka; Endoh, Hiroyuki; Ishii, Kei; and Suzuki, Keitaro, 4,648,903, Cl. 75-230.000.

Suzuki, Nobuo: *See*—
Sekine, Hirokazu; Morimune, Katuhiko; Watanabe, Masaharu; and Suzuki, Nobuo, 4,649,408, Cl. 357-24.000.

Suzuki, Tadao: *See*—
Abe, Miki; and Suzuki, Tadao, 4,649,372, Cl. 340-347.0NT.

Suzuki, Toshiyuki; and Nishikawa, Reiji, to Kabushiki Kaisha Toshiba. Magnetic recording medium. 4,649,073, Cl. 428-212.000.

Svoboda, Jaroslav: *See*—
Krouglicof, Nicholas; McKinnon, Gordon M.; and Svoboda, Jaroslav, 4,649,504, Cl. 364-559.000.

Swanson, Gary J.: *See*—
Veldkamp, Wilfrid B.; Leger, James R.; and Swanson, Gary J., 4,649,351, Cl. 330-4.300.

Swanson, Glen E.: *See*—
Swanson, Mark E.; and Swanson, Glen E., 4,648,644, Cl. 293-118.000.

Swanson, Mark E.; and Swanson, Glen E. Automobile protection device. 4,648,644, Cl. 293-118.000.

Swanson, Vernon F., to Western States Minerals Corp. Fluidized bed apparatus. 4,648,969, Cl. 210-237.000.

Swartz, John C.: *See*—
Atherton, Charles G.; and Swartz, John C., 4,649,304, Cl. 310-71.000.

SWF Auto-Electric GmbH: *See*—
Egner-Walter, Bruno; Neubauer, Walter; Schmid, Eckhardt; and Scholl, Wolfgang, 4,648,148, Cl. 15-250.210.
Erdelitsch, Herbert; Gaudich, Werner; and Hecht, Walter, 4,648,728, Cl. 384-537.000.

Swift, Patricia A.: *See*—
Georgiev, Vassil S.; Mullen, George B.; and Swift, Patricia A., 4,649,222, Cl. 564-459.000.

Syldatk, Andreas: *See*—
Krause, Horst-Jurgen; Syldatk, Andreas; and Sung, Eric, 4,648,984, Cl. 252-174.220.

Szabo, Jozsef: *See*—
Szucs, Laszlo; Szabo, Jozsef; and Tasnadi , Csaba, 4,648,443, Cl. 165-181.000.

Szakacs, Gabor L.: *See*—
Kaltenbach, Karl W.; Rettew, Stephen; Rudy, John O.; and Szakacs, Gabor L., 4,649,028, Cl. 422-100.000.

Szerdahelyi, Ferenc: *See*—
Baldamus, Haimo; Szerdahelyi, Ferenc; Hess, Peter; and Bauer, Manfred, 4,648,208, Cl. 49-502.000.

Szluk, Nicholas J.: *See*—
Metz, Werner A., Jr.; Szluk, Nicholas J.; Miller, Gayle W.; Drury, Michael J.; and Sullivan, Paul A., 4,648,175, Cl. 29-589.000.

Szucs, Laszlo; Szabo, Jozsef; and Tasnadi , Csaba, to Energiagazdalkodasi Intezet. Heat exchanger with ribbed fin. 4,648,443, Cl. 165-181.000.

T.D.J. Co., Inc.: *See*—
Rolle, Thomas E.; Nebel, David J.; Shulan, John L.; and Liljestrom, William P., 4,648,560, Cl. 241-24.000.

Tabuchi, Hiroki: *See*—
Furubayashi, Hisatoshi; Tabuchi, Hiroki; and Hijikigawa, Masaya, 4,649,365, Cl. 338-25.000.

Tachibana, Natsuki; and Ichihara, Issey, to Kabushiki Kaisha Toshiba. Cleaning device. 4,648,705, Cl. 355-15.000.

Tachikawa Spring Co., Ltd.: *See*—
Sakamoto, Takao, 4,648,578, Cl. 248-576.000.

Tada, Hiroshi: *See*—
Kitta, Toshiyuki; Tada, Hiroshi; and Ishikawa, Keizo, 4,648,224, Cl. 52-223.00R.

Tadokoro, Eiichi: *See*—
Ryoke, Katsumi; Yamaguchi, Nobutaka; Takahashi, Masatoshi; Hanai, Kazuko; Kosha, Hideaki; and Tadokoro, Eiichi, 4,649,072, Cl. 428-212.000.

Taga, Yutaka: *See*—
Kubo, Seitoku; Taga, Yutaka; and Nakamura, Shinya, 4,648,289, Cl. 74-866.000.

Taguchi, Kazuhisa: *See*—
Tsukada, Satoshi; and Taguchi, Kazuhisa, 4,649,097, Cl. 430-270.000.

Tahata, Masahiro; and Washizu, Hirokazu, to Kabushiki Kaisha Toshiba. Closed type compressor. 4,648,811, Cl. 417-410.000.

Tairaka, Yoshihiko, to Takeda Chemical Industries, Ltd. Flame-retardant polyurethane foam and polyol composition therefor. 4,649,163, Cl. 521-107.000.

Tajima, Ichiro; and Yamamoto, Minoru, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Composite material and process for producing the same. 4,649,071, Cl. 428-212.000.

Takada, Hiroyuki: *See*—
Wada, Shunichi; Shimomura, Setsuhiro; Kumagai, Naotake; Takizawa, Shozo; Maruyama, Mitsunori; Tatemoto, Minoru; Takada, Hiroyuki; and Harara, Mitsuhiko, 4,648,622, Cl. 280-707.000.

Takafuji, Hideo: *See*—
Minamida, Katsuhiro; Takafuji, Hideo; Haga, Hiroya; and Mizuhashi, Nobuo, 4,649,256, Cl. 219-121.0LD.

Takagaki, Hitohisa, to Polyplastics Co., Ltd. Polyacetal resin composition. 4,649,179, Cl. 525-400.000.

Takahashi, Hiroshi, to Casio Computer Co., Ltd. Electronic cash register with means to store and correlate data on a customer by customer basis. 4,649,481, Cl. 364-405.000.

Takahashi, Hiroshi: *See*—
Inaba, Masao; Takahashi, Hiroshi; Nosaka, Kazuhiko; and Hattori, Takahiko, 4,649,507, Cl. 364-724.000.

Takahashi, Isao: *See*—
Ishii, Toshio; Sakamoto, Yasuhisa; and Takahashi, Isao, 4,648,381, Cl. 126-20.000.

Takahashi, Kazuo, to Canon Kabushiki Kaisha. Guide mechanism. 4,648,725, Cl. 384-9.000.

Takahashi, Kenji: *See*—
Kodama, Takuma; Takahashi, Kenji; Ishibashi, Shizuka; Kudo, Koji; Masuda, Yukihiro; Hombough, Masanori; Miyoshi, Osamu; and Yoshiwara, Kazuhisa, 4,649,421, Cl. 358-51.000.

Takahashi, Masatoshi: *See*—
Ryoke, Katsumi; Yamaguchi, Nobutaka; Takahashi, Masatoshi; Hanai, Kazuko; Kosha, Hideaki; and Tadokoro, Eiichi, 4,649,072, Cl. 428-212.000.

Takahashi, Osamu; and Sakai, Minoru, to Fuji Photo Film Co., Ltd. Color diffusion transfer photographic film unit containing aluminum compound. 4,649,095, Cl. 430-216.000.

Takahashi, Tohru: *See*—
Tamura, Yasuyuki; Kaneko, Shuzo; and Takahashi, Tohru, 4,649,094, Cl. 430-126.000.

Takahashi, Toshiki: *See*—
Miyata, Toshimi; Takahashi, Toshiki; and Matsumoto, Kenji, 4,648,222, Cl. 52-208.000.

Takahashi, Toshio: *See*—
Hayase, Yoshio; Morita, Koichi; Ide, Kinya; and Takahashi, Toshio, 4,648,898, Cl. 71-93.000.

Takahashi, Yasutada: *See*—
Takahashi, Yutaka; and Takahashi, Yasutada, 4,648,424, Cl. 137-504.000.

Takahashi, Yoshitaka: *See*—
Hanyu, Susumu; Kata, Kenji; and Takahashi, Yoshitaka, 4,648,340, Cl. 112-447.000.
Kato, Kenji; Yamaguchi, Yoshio; and Takahashi, Yoshitaka, 4,648,341, Cl. 112-458.000.

Takahashi, Yutaka; and Takahashi, Yasutada, to Kirin Beer Kabushiki Kaisha. Liquid flow rate controller. 4,648,424, Cl. 137-504.000.

Takamizawa, Minoru; Yamamoto, Akira; Ishihara, Toshinobu; and Nagura, Shigehiro, to Shin-Etsu Chemical Co., Ltd. Contact lens comprising trimethylvinylsilane polymer. 4,649,185, Cl. 526-279.000.

Takasugi, Hisashi: *See*—
Takaya, Takao; Takasugi, Hisashi; and Yamanaka, Hideaki, 4,649,136, Cl. 514-202.000.
Takaya, Takao; and Takasugi, Hisashi, 4,649,146, Cl. 514-307.000.

Takasuka, Yutaka; Mohri, Kunihiko; and Kawaguchi, Akiko, to Pola Chemical Industries Inc. Coated pigment and cosmetic materials comprising the same. 4,648,908, Cl. 106-308.00F.

Takaya, Takao; Takasugi, Hisashi; and Yamanaka, Hideaki, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds. 4,649,136, Cl. 514-202.000.

Takaya, Takao; Murata, Masayoshi; and Ito, Kiyotaka, to Fujisawa Pharmaceutical Co., Ltd. 3,4-dihydro-1,3-disubstituted-6-(substituted phenylimino)-2(1H)-pyrimidinone useful as cardiotonic agent and anti-allergic agent. 4,649,142, Cl. 514-274.000.

Takaya, Takao; and Takasugi, Hisashi, to Fujisawa Pharmaceutical Co., Ltd. Thiazole derivatives and pharmaceutical composition comprising the same. 4,649,146, Cl. 514-307.000.

Takeda Chemical Industries, Ltd.: *See*—
Nojima, Shoshichi; Nomura, Hiroaki; and Tsushima, Susumu, 4,649,203, Cl. 548-112.000.
Tairaka, Yoshihiko, 4,649,163, Cl. 521-107.000.

Takeda, Keiji, to Fuji Photo Film Co., Ltd. Image recording process using both silver halide and vinyl monomers. 4,649,098, Cl. 430-270.000.

Takeda, Makoto; Nonomura, Keisaku; and Funada, Fumiaki, to Sharp Kabushiki Kaisha. Method of driving liquid crystal display device. 4,649,383, Cl. 340-805.000.

Takeda, Nobuhiro; and Hattori, Masaichi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Power supply circuit for vehicle. 4,649,286, Cl. 307-10.00R.

Takegushi, Shunsuke: *See*—
Umeha, Genkichi; Urano, Shigeru; Hirakawa, Osamu; and Takegushi, Shunsuke, 4,649,011, Cl. 264-267.000.

Takemae, Yoshihiro; Nakano, Tomio; and Sato, Kimiaki, to Fujitsu Limited. Semiconductor memory device having stacked capacitor-type memory cells. 4,649,406, Cl. 357-23.600.

Takemoto Yushi Kabushiki Kaisha: *See*—
Namiki, Mitsuo; Osawa, Toshihiko; Fukuda, Yasuko; and Ozaki, Tatsuhiko, 4,649,206, Cl. 549-435.000.

Takeuchi, Tetsuo: *See*—
Mukunoki, Yasuo; Yokoyama, Shigeki; Kawasaki, Hiroshi; Nemori, Ryoichi; and Takeuchi, Tetsuo, 4,649,102, Cl. 430-527.000.

Takeuchi, Yukihisa; and Masumori, Hideo, to NGK Insulators, Ltd. Ceramic composition for dielectrics. 4,649,125, Cl. 501-15.000.

Takeya, Eisaku: *See*—
Noguchi, Yoshikazu; Yokoi, Tatsuhisa; Takeya, Eisaku; and Osawa, Hideyuki, 4,648,373, Cl. 123-568.000.

Takezoe, Osamu: *See*—
Asano, Kazuhiko; Takezoe, Osamu; Yasuda, Yoshinori; Hayashi, Kenji; Aoki, Masanobu; Doi, Yoshio; and Shimata, Makoto, 4,648,918, Cl. 148-439.000.

Takiyama, Masashi: *See*—
Watanabe, Kenshu; Uchikawa, Tadashi; Takiyama, Masashi; and Kurahashi, Takashi, 4,648,425, Cl. 137-557.000.

Takizawa, Shozo: *See*—
Wada, Shunichi; Shimomura, Setsuhiro; Kumagai, Naotake; Takizawa, Shozo; Maruyama, Mitsunori; Tatemoto, Minoru; Takada, Hiroyuki; and Harara, Mitsuhiko, 4,648,622, Cl. 280-707.000.

Takizawa, Takashi; and Tanaka, Tsutomu, to Sanyo Electric Co; and Tokyo Sanyo Electric. Low-temperature showcase. 4,648,247, Cl. 62-256.000.

Talbot, Douglas C., to CMI, Inc. Breath tester. 4,649,027, Cl. 422-84.000.

Talbot, Laurel C.; and Reed, Wilbur T., to B. H. Tytewadd Marketing, Incorporated. Surge protection device. 4,649,457, Cl. 361-127.000.

Taleyarkhan, Rusi P., to Westinghouse Electric Corp. BWR fuel assembly with water flow mixing chamber at fuel bundle/water cross entrance. 4,649,021, Cl. 376-444.000.

Talwar, Anil K.: *See*—
Peters, David; Denick, John, Jr.; and Talwar, Anil K., 4,649,041, Cl. 424-484.000.

Tam International, Inc.: *See*—
Sanford, Lawrence; Stokley, Charles O.; and Turner, Edwin C., 4,648,448, Cl. 166-187.000.

Tamai, Yasuo: *See*—
Ogawa, Hiroshi; Saito, Shinji; Mizuno, Chiaki; and Tamai, Yasuo, 4,649,081, Cl. 428-447.000.

Tamaki, Kentaro: *See*—
Yamauchi, Takayoshi; Hattori, Kaneaki; Ikeda, Shun-ichi; Nakao, Kenji; and Tamaki, Kentaro, 4,649,213, Cl. 560-56.000.

Tamarack Scientific Co., Inc.: *See*—
Sheets, Ronald E., 4,649,261, Cl. 219-390.000.

Tamata, Shin: *See*—
Uetake, Naohito; Kawamura, Fumio; Yusa, Hideo; Kikuchi, Makoto; and Tamata, Shin, 4,648,990, Cl. 252-628.000.

Tami, Kazuya: *See*—
Hiramatsu, Tooru; Tami, Kazuya; and Osawa, Kozo, 4,648,335, Cl. 112-114.000.

Tamura, Yasuyuki; Kaneko, Shuzo; and Takahashi, Tohru, to Canon Kabushiki Kaisha. Image formation method and apparatus in which imaging light and conductive toner are applied to opposite surfaces of a photosensitive member. 4,649,094, Cl. 430-126.000.

Tan, Patrick; Maitland, Peter; Kawczynski, Gregory; and Camposeo, Paul V. Educational and laboratory work cell for a robotic device. 4,648,783, Cl. 414-730.000.

Tanahashi, Maki; Horiike, Sumio; and Nakano, Hiroyuki, to Omron Tateisi Electronics Co. Bifunctional environment sensor. 4,649,364, Cl. 338-14.000.

Tanaka, Hidenori, to Victor Company of Japan, Ltd. System for reproducing a video signal in a still picture reproduction. 4,649,439, Cl. 360-10.300.

Tanaka, Hideo; Ohhashi, Kuniyoshi; Gomi, Tatsuya; and Dobashi, Tomoyuki, to Suntory Limited; and Dainippon Ink and Chemicals, Inc. Beer container having means for frothing the content thereof. 4,649,054, Cl. 426-397.000.

Tanaka, Mikio: *See*—
Doki, Yoshikuni; Fujiwara, Masatoshi; Shiga, Tatsuhide; Shono, Yohsuke; Tanaka, Mikio; and Tsuruoka, Yoshihiro, 4,649,359, Cl. 335-222.000.

Tanaka, Teruaki: *See*—
Yamaguchi, Hiroshi; Tanaka, Teruaki; Hirai, Masatake; Kohketsu, Tadashi; Matsumoto, Masahiro; and Kawate, Kenji, 4,649,248, Cl. 219-10.570.

Tanaka, Tomio: *See*—
Itoh, Hiroshi; Nitta, Atsuhiko; Tanaka, Tomio; and Kamio, Hideo, 4,649,219, Cl. 564-207.000.

Tanaka, Toshio; Hazato, Atsuo; and Kurozumi, Seizi, to Teijin Limited. 6-nitroprostaglandin derivatives. 4,649,156, Cl. 514-530.000.

Tanaka, Tsutomu: *See*—
Takizawa, Takashi; and Tanaka, Tsutomu, 4,648,247, Cl. 62-256.000.

Tanasescu, Leo, to Petro Fax, Inc. Reader-printer system. 4,648,707, Cl. 355-45.000.

Tandy Corporation: *See*—
Berger, Michael F., 4,649,514, Cl. 364-900.000.

Taniguchi, Seiho: *See*—
Kotani, Kunio; Hayashi, Akio; and Taniguchi, Seiho, 4,648,986, Cl. 252-511.000.

Tantraporn, Wirojana: *See*—
Temple, Victor A. K.; and Tantraporn, Wirojana, 4,648,174, Cl. 29-578.000.

Tarozzi, Richard A.; and Formhals, Charles, to King-Seeley Thermos Co. Portable cooler with side receptacle. 4,648,512, Cl. 206-542.000.

Tarver, Stephen C. Air injector. 4,648,997, Cl. 261-25.000.

Tasnadi , Csaba: *See*—
Szucs, Laszlo; Szabo, Jozsef; and Tasnadi , Csaba, 4,648,443, Cl. 165-181.000.

Tatabanyai Szen banyak: *See*—
Matyas, Bela; Gerber, Pal; Solymos, Andras; Kaszanitzky, Ferenc; Panto, Gyorgy; and Leffler, Janos, 4,649,031, Cl. 423-20.000.

Tatemoto, Minoru: *See*—
Wada, Shunichi; Shimomura, Setsuhiro; Kumagai, Naotake; Takizawa, Shozo; Maruyama, Mitsunori; Tatemoto, Minoru; Takada, Hiroyuki; and Harara, Mitsuhiko, 4,648,622, Cl. 280-707.000.

Tatro, Bernard J.: *See*—
Agdanowski, Ronald T.; Geil, James A.; and Tatro, Bernard J., 4,648,398, Cl. 128-207.180.

Taylor, Gordon J. Brake shoe retainer mounting assembly. 4,648,491, Cl. 188-341.000.

Taylor, John W., Jr.; and Hodges, Michael J., to Westinghouse Electric Corp. Stacked beam radar and target height measurement extractor especially for use therein. 4,649,389, Cl. 342-123.000.

Technicare Corporation: *See*—
Flugan, David C., 4,649,348, Cl. 324-318.000.
Yeung, Hong-Ning; Kao, Chiiming; and Lent, Arnold H., 4,649,346, Cl. 324-309.000.

Tecumseh Products Company: *See*—
Kronich, Peter G., 4,648,363, Cl. 123-196.00R.

Teepak, Inc.: *See*—
Story, Alfred D., 4,648,428, Cl. 138-118.100.

Teijin Limited: *See*—
Tanaka, Toshio; Hazato, Atsuo; and Kurozumi, Seizi, 4,649,156, Cl. 514-530.000.

Tekken Construction Co., Ltd.: *See*—
Odashima, Takashi, 4,648,462, Cl. 169-61.000.

Telecommunications Radioelectriques et Telephoniques: *See*—
Lassaux, Jean; and Clement, Henry, 4,649,335, Cl. 324-52.000.

Teleflex Incorporated: *See*—
Bennett, William G.; and Spease, Arthur L., 4,649,010, Cl. 264-242.000.

Telefunken Fernseh und Rundfunk GmbH: *See*—
Sander, Hans-Dieter; and Streckenbach, Wulf-Christian, 4,649,551, Cl. 375-81.000.

Tellan, Alberto; Desarzens, Pierre; and Deglon, Philippe, to Omega Electronics S.A. Energizing arrangement for controlling the luminous intensity of at least one discharge lamp and use of such arrangement. 4,649,322, Cl. 315-306.000.

Teloc R & D Ltd.: *See*—
Aires, Ramon H.; Clark, Charles A., Jr.; Ito, Roy A.; and Hackett, Kenneth R., 4,649,385, Cl. 379-57.000.

Temple University: *See*—
Labes, Mortimer M.; and Chen, Jiann H., 4,649,038, Cl. 423-364.000.

Temple, Victor A. K.; and Tantraporn, Wirojana, to General Electric Company. Method of making high breakdown voltage semiconductor device. 4,648,174, Cl. 29-578.000.

Tennessee Valley Authority: *See*—
Hsieh, Shaung-shii, 4,648,966, Cl. 209-167.000.

Terai, Hiroshi: *See*—
Noda, Takazki; and Terai, Hiroshi, 4,648,887, Cl. 55-2.000.

Teranishi, Haruo: *See*—
Ishikawa, Toshikatsu; Teranishi, Haruo; Imai, Yoshikazu; and Nagata, Yoichi, 4,649,060, Cl. 427-57.000.

Terashi, Hiroto, to Asahi Kogaku Kogyo Kabushiki Kaisha. Video camera iris control circuit. 4,649,431, Cl. 358-228.000.

Terbrack, William H.; Brion, Harvey F.; and Minear, Ronald J., to Hughes Aircraft Company. Headset receiver cartridge and earphone case therefor. 4,649,570, Cl. 455-344.000.

Terra, Luigi; Sada, Edoardo; and Colombo, Sergio, to S.E.L.O. Societa Elettronica Lombarda S.p.A. Multipurpose apparatus for normal or tomographic investigations by means of a gamma camera. 4,649,277, Cl. 250-363.00S.

Terumo Corporation: *See*—
Kobayashi, Susumu; and Morikawa, Hideyuki, 4,648,812, Cl. 417-477.000.

Tetard, Roger: *See*—
David, Bernard; and Tetard, Roger, 4,648,857, Cl. 474-272.000.

Texaco Inc.: *See*—
Carlin, Joseph T.; and Haferkamp, Gilbert L., 4,648,452, Cl. 166-274.000.

Texas Instruments, Incorporated: *See*—
Hynecek, Jaroslav, 4,649,430, Cl. 358-213.000.
Kelly, John C., 4,649,413, Cl. 357-41.000.

Thayer, William L.: *See*—
Capes, Charles E.; Coleman, Richard D.; Thayer, William L.; and Puddington, Ira E., 4,648,962, Cl. 208-188.000.

Theeuwes, Felix: *See*—
Urquhart, John; and Theeuwes, Felix, 4,649,043, Cl. 424-469.000.

Thelen, Franz, to Steag AG. Process for the reduction of NO_x in fluidized-bed furnaces. 4,648,331, Cl. 110-342.000.

Thiel, Klaus P.; Sindlinger, Raimund; and Merrem, Hans J., to Merck Patent Gesellschaft mit beschrankter Haftung. Process for the production of photoresist relief structures having an overhang character using o-quinone diazide photoresist with overexposure. 4,649,101, Cl. 430-326.000.

Thielen, James E., to Minnesota Mining and Manufacturing Company. Locking pin. 4,648,738, Cl. 403-341.000.

Thom, Terrence C., to Can-Eng Holdings, Ltd. Rotary retort furnace. 4,648,836, Cl. 432-107.000.

Thomas, Larry D.; Waltke, David L.; and Gibson, Gary, to Hoover Group, Inc. Composite metal and plastic tank. 4,648,521, Cl. 220-1.500.

Thomason, Linda R. Brake condition indicator. 4,649,370, Cl. 340-52.00B.

Thompson, Arthur H.; and Katz, Alan J., to Exxon Production Research Co. Method for determining physical properties of a porous sample using capillary pressure measurement. 4,648,261, Cl. 73-38.000.

Thompson, John A.; and Keogh, Christopher B., to Henkel Corporation. Crosslinked vinyl polymer compositions and process for preparing molded shaped articles. 4,649,169, Cl. 524-247.000.

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Proebsting, Robert J., 4,649,540, Cl. 371-37.000.
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Blanchard, Pierre, 4,648,941, Cl. 156-657.000.
Robin, Philippe; Micheron, Francois; Petit, Patrick; and Broussoux, Dominique, 4,649,312, Cl. 310-330.000.

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Morita, Yutaka; Katayama, Masayoshi; and Kato, Takashi, 4,648,281, Cl. 73-861.910.

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Kimura, Toshio; Nakagawa, Shuichi; Tokumo, Teruhiko; Yamamoto, Hiroyuki; Kotan, Hiroshi; Otsu, Hiroshi; and Satoh, Tetsuya, 4,649,399, Cl. 346-32.000.

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Masuda, Mitsuhiro; Igarashi, Osamu; Tokuyama, Keiichi; and Katogi, Kozo, 4,649,381, Cl. 340-784.000.

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Hiramatsu, Tooru; Tami, Kazuya; and Osawa, Kozo, 4,648,335, Cl. 112-114.000.

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Kanuma, Akira, 4,649,508, Cl. 364-748.000.
Matsubayashi, Takayuki, 4,649,555, Cl. 378-4.000.
Ohashi, Hiromichi, 4,649,410, Cl. 357-30.000.
Roppongi, Makoto; and Tsuji, Kazuaki, 4,649,409, Cl. 357-30.000.
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Sikora, Scott T., 4,648,781, Cl. 414-401.000.

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Tone, Yasuyoshi, to Saami Co., Ltd. Rectangular tile-like carpet. 4,649,069, Cl. 428-82.000.
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Gass, Karl; Fory, Werner; Meyer, Willy; and Topfl, Werner, 4,648,899, Cl. 71-93.000.
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Ogasawara, Masafumi; Yamaguchi, Nobu; and Moriki, Yoshikazu, 4,648,826, Cl. 425-192.00S.
Toray Silicone Co., Ltd.: *See*—
Kobayashi, Masaru; Koyanagi, Hironobu; and Sato, Takahiro, 4,649,005, Cl. 264-101.000.
Torban, Yefim; and Hary, Joseph, to Allied Corporation. Self locking coupling device. 4,648,671, Cl. 339-89.00R.
Torres, John R.: *See*—
Vesce, Richard V.; and Torres, John R., 4,649,467, Cl. 363-41.000.
Toshiba Silicone Co., Ltd.: *See*—
Zenbayashi, Michio; and Sato, Noria, 4,649,208, Cl. 556-413.000.
Toshiichi, Sugiyama. Weeder for removing weeds having various lengths. 4,648,463, Cl. 171-61.000.
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Grosjean, Yves H., 4,648,268, Cl. 73-152.000.
Herve, Jean-Luc; Jouanneau, Jean-Francois; Kristensen, Ivar G.; and Haugen, Finn, 4,648,419, Cl. 137-245.500.
Puisais, Xavier F.; Hamon, Jean-Pierre; Jegousse, Michel; and Kaluszynski, Michel, 4,648,544, Cl. 228-44.500.
Total, Robert V., to Oscar Mayer Foods Corp. Stack handling method and apparatus. 4,648,237, Cl. 53-473.000.
Toth, John E.; and Hempfling, Ronald L., to Cubic Western Data. Safe locking mechanism. 4,648,327, Cl. 109-57.000.
Tower, Steven A.: *See*—
Scherer, Jeremy D.; and Tower, Steven A., 4,649,229, Cl. 174-52.0FP.
Toyo Contact Lens Co., Ltd.: *See*—
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Toyo Machinery Co., Ltd.: *See*—
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Toyo Seikan Kaisha, Ltd.: *See*—
Nohara, Shigezo; Sugimoto, Takeshi; Sakano, Kozaburo; Ohkubo, Yoshimichi; and Matsuo, Junichi, 4,649,004, Cl. 264-85.000.
Yamamoto, Osamu; and Yamada, Muneki, 4,649,013, Cl. 264-318.000.
Toyoda Cesei Co., Ltd.: *See*—
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Toyoda Gosei Co., Ltd.: *See*—
Shibasaki, Jun, 4,648,207, Cl. 49-441.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Hyodo, Yoichi; and Harata, Mitsuru, 4,648,164, Cl. 29-159.00B.
Hyodo, Youichi, 4,648,614, Cl. 280-91.000.
Ikeda, Shinji, 4,648,266, Cl. 73-117.300.
Kobayashi, Nobuyuki; and Hattori, Takashi, 4,648,370, Cl. 123-489.000.
Kubo, Seitoku; Taga, Yutaka; and Nakamura, Shinya, 4,648,289, Cl. 74-866.000.
Noguchi, Yoshikazu; Yokoi, Tatsuhisa; Takeya, Eisaku; and Osawa, Hideyuki, 4,648,373, Cl. 123-568.000.
Nomura, Yoshihisa; Ishikawa, Masakazu; Shirai, Akira; Nogami, Takahiro; Nakamura, Kazumasa; and Ohashi, Kaoru, 4,648,663, Cl. 303-106.000.
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Osansi, Akinori; Niwa, Takao; and Gono, Takeshi, 4,649,485, Cl. 364-424.100.
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Trainer, Michael N., to General Signal Corporation. Photoelastic measuring transducer and accelerometer based thereon. 4,648,274, Cl. 73-517.00R.
Treiber, Helmut: *See*—
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Tributsch, Helmut; Ennaoui, Ahmed; Jaegermann, Wolfram; and Fiechter, Sebastian. Photoactive pyrite layer and process for making and using same. 4,649,227, Cl. 136-252.000.
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Cassey, Russell A., 4,648,860, Cl. 493-195.000.
Trine Products Corp.: *See*—
Gaines, Bernard S., 4,648,675, Cl. 339-97.00P.
Trocherie, Jean-Pierre, to Moulinex Societe Anonyme. Beating/emulsifying tool for a domestic electrical appliance for food preparation. 4,648,720, Cl. 366-306.000.
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Troscinski, David W.: *See*—
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Trutna, Maynard A., to Jefferson Smurfit Corporation. Self-locking container. 4,648,549, Cl. 229-143.000.
TRW, Inc.: *See*—
Rabe, William T., 4,648,307, Cl. 91-375.00A.
Tsubai, Yasuo; Okazaki, Koji; Horii, Shoichi; and Yoshida, Akio, to Mitsubishi Paper Mills, Ltd. Processing compositions for silver complex diffusion transfer process. 4,649,096, Cl. 430-249.000.
Tsuchida, Manabu; and Yoshida, Masanobu, to Fujitsu Limited. Programmable read-only memory (PROM) device having reduced programming voltage capability. 4,649,521, Cl. 365-185.000.
Tsuchiya, Shizuo: *See*—
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Tsuda, George I.; and Edelsohn, Charles R., to Hughes Aircraft Company. Monopulse cavity-backed multipole antenna system. 4,649,391, Cl. 342-153.000.
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Ueda, Jun; Tsukada, Hirokazu; and Nanba, Yoichi, 4,649,414, Cl. 357-53.000.
Tsukada, Satoshi; and Taguchi, Kazuhisa, to Mitsubishi Paper Mills Ltd. Corona discharge apparatus and method for corona discharge treatment. 4,649,097, Cl. 430-270.000.
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Tsunoda, Teruo; and Kokawa, Ryoichi, to Komori Printing Machinery Co., Ltd. Method and system for processing image signals. 4,649,566, Cl. 382-1.000.
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Tsushima, Takuya, to Victor Company of Japan, Ltd. Video signal delay circuit. 4,649,427, Cl. 358-160.000.
Tubbs, Joseph T., to 501 Trans World Connections Ltd. Modular adapter and connector cable for video equipment. 4,648,682, Cl. 339-154.00A.
Tuhy, Frank P., Jr., to AT&T Bell Laboratories. Non-saturating tri-state driver circuit. 4,649,298, Cl. 307-473.000.
Turner, Edwin C.: *See*—
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Uba, Toshio; and Nelson, Robert F., to Gates Energy Products, Inc. Method for producing a sealed lead-acid cell. 4,648,177, Cl. 29-623.200.
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Uchino, Hayashi; Azuma, Masaaki; Ohashi, Takehisa; and Watanabe, Kiyoshi, to Kanegafuchi Kagaku Kogyo Kabushiki. Sulfate of 5,6,7,8-tetrahydro-L-erythro-biopterin and process for preparing the same. 4,649,197, Cl. 544-258.000.
Uden, Edward, to U.S. Philips Corporation. Data card and method of manufacturing same. 4,649,418, Cl. 357-80.000.
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Uetake, Naohito; Kawamura, Fumio; Yusa, Hideo; Kikuchi, Makoto; and Tamata, Shin, to Hitachi, Ltd. Solidified radioactive wastes and process for producing the same. 4,648,990, Cl. 252-628.000.
Ulbrich, Gerald; and Neuhaus, Detlev, to WABCO Westinghouse Fahrzeugbremsen GmbH. Inductive measuring arrangement for determining the position of a movable core member. 4,649,341, Cl. 324-207.000.
Ullman, Wolfgang, to ANT Nachrichtentechnik GmbH. Rotary microwave switch. 4,649,355, Cl. 333-106.000.
Ullrich, Hansjurgen; and Geipel, Werner, to Paul Rauschert GmbH & Co. Kg. Liquid distributor for material exchange columns. 4,648,972, Cl. 210-541.000.
Ulug, Mehmet E., to General Electric Company. Method and apparatus for maintaining a dynamic logical ring in a token passing LAN. 4,649,535, Cl. 370-86.000.
Umeha, Genkichi; Urano, Shigeru; Hirakawa, Osamu; and Takegushi, Shunsuke, to Nippon Piston Ring Co., Ltd. Method of making a cam shaft. 4,649,011, Cl. 264-267.000.
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Bartley, William J., 4,649,225, Cl. 568-678.000.
Garg, Desh R.; and Ritscher, James S., 4,648,977, Cl. 210-673.000.

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Ashby, Carol I. H.; and Dishman, James L., 4,648,938, Cl. 156-643.000.
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Kaizer, Adrianus J. M.; Sangster, Frederik L. J.; and Wesche, Cornelis A. M., 4,649,565, Cl. 381-90.000.
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Fradenburgh, Evan A.; Kiely, Edmond F.; and Miller, Gordon G., 4,648,800, Cl. 416-134.00A.
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Nutter, Harry A., Jr., 4,648,921, Cl. 156-77.000.
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Vesce, Richard V.; and Torres, John R., 4,649,467, Cl. 363-41.000.
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Urquhart, John; and Theeuwes, Felix, to ALZA Corporation. Drug delivery system for delivering a plurality of tiny pills in the gastrointestinal tract. 4,649,043, Cl. 424-469.000.
USM Corporation: *See—*
Pendleton, Richard A., 4,648,259, Cl. 72-391.000.
Utman, Leslie H.; and Rifkin, M S. Trailer coupler lock with protective housing. 4,648,618, Cl. 280-507.000.
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Porteous, Don D.; and Valle, Ornan, 4,648,906, Cl. 106-35.000.
Van Camp, Richard H., to Hobart Corporation. Gas convection oven and heat exchanger therefor. 4,648,377, Cl. 126-21.00A.
Vance, James B., to Potash Corporation of Saskatchewan Mining Limited. Integrated acoustic network. 4,649,524, Cl. 367-13.000.
Van Compernolle, Dirk S., to Leland Stanford Junior University, The Board of Trustees of the. Method and apparatus for providing spread correction in a multi-channel cochlear prosthesis. 4,648,403, Cl. 128-419.00R.
Van den Heuvel, Raymond C. Vector generator using interpolative analog circuits. 4,649,506, Cl. 364-607.000.
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van der Lely, Cornelis. Tractor for agricultural purposes. 4,648,472, Cl. 180-24.000.
VanderLugt, Thomas, to James River Corporation of Virginia. Carton for dispensing sheet material in roll form. 4,648,536, Cl. 225-43.000.
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Van Der Molen, Engelbertus J.: *See—*
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Vandervoort, David; and Griffith, Monty, to Bridgford Foods Corporation. Apparatus for automatically subdividing dough in a single use, nonmetallic tray. 4,648,822, Cl. 425-135.000.
van de Sluys, Willem L. N.; Pastoor, Jacobus; and Roelofs, Johannus C. M., to U.S. Philips Corporation. Heat exchanger comprising a finned pipe. 4,648,441, Cl. 165-111.000.
Van Dijck, Paul C. M.; Ligtvoet, Theo F. M. C.; and Van Leemput, Leo J. J., to Janssen Pharmaceutica, N.V. Water-dilutable wood-preserving liquids. 4,648,988, Cl. 252-602.000.
Van Kuren, Gerald B. Collapsible picnic table. 4,648,652, Cl. 297-159.000.
Van Leemput, Leo J. J.: *See—*
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Van Rooy, Willy: *See—*
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Vansant, Jan: *See—*
Nolf, Jean-Marie E.; Genbrugge, Hubert; Buekers, Valere; Mendes, Luiz N.; Doucet, Jos; and Vansant, Jan, 4,648,168, Cl. 29-447.000.
Van Steenburg, Kip P.: *See—*
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Vantard, Georges: *See—*
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Van Tran, Hiep, to Thomson Components-Mostek Corp. Multiple-input sense amplifier with two CMOS differential stages driving a high-gain stage. 4,649,301, Cl. 307-530.000.
Van Wagenen, Richard A.: *See—*
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Van Wijnendaele, Frans; and Simonet, Guy, to Smith Kline-RIT. Method for the isolation and purification of hepatitis B surface antigen using polysorbate. 4,649,192, Cl. 530-371.000.

Vater, George R.; and Horsch, Joachim, to J. I. Case Company. Clutch assembly and lubrication arrangement. 4,648,495, Cl. 192-70.120.

Vazehgoo, Farhad, to Fairchild Semiconductor Corporation. TTL circuits generating complementary signals. 4,649,297, Cl. 307-456.000.

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Neuer, Andreas; Grimmer, Eberhard; and Muller, Hartwig, 4,648,249, Cl. 66-75.200.

Veech, Richard L. Electrolyte solutions containing polyanionic materials. 4,649,050, Cl. 424-153.000.

Veglia, Bartolomeo, to RIV-SKF Officine di Villar Perosa S.p.A. Transmission unit for a vehicle with a transverse engine and half-shafts of equal length, having an intermediate shaft provided with a resilient support. 4,648,475, Cl. 180-297.000.

Veldkamp, Wilfrid B.; Leger, James R.; and Swanson, Gary J., to Massachusetts Institute of Technology. Apparatus and method for coherently adding laser beams. 4,649,351, Cl. 330-4.300.

Verbergt, Jan: *See*—
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Verhoeven, Leonardus A. J., to U.S. Philips Corporation. Arrangement for making a photographic slide or cine-film recording of a television picture. 4,649,433, Cl. 358-244.000.

Verner, Michael L., to Maxon Industries, Inc. Refuse pickup and compactor body. 4,648,775, Cl. 414-513.000.

Vesce, Richard V.; and Torres, John R., to United Technologies Corporation. High efficiency MOSFET sine wave generator. 4,649,467, Cl. 363-41.000.

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Vetco Offshore, Inc.: *See*—
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Victor Company of Japan, Ltd.: *See*—
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Vidal, Jean-Charles: *See*—
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Viegers, Mathias P. A.: *See*—
Hornstra, Jan; and Viegers, Mathias P. A., 4,649,557, Cl. 378-84.000.

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VirTis Company, Inc., The: *See*—
Anderson, John A., 4,649,118, Cl. 435-316.000.

VMEI "Lenin": *See*—
Savov, Svetoslav A.; Mintchev, Mintcho S.; Nitchev, Peter T.; and Shivarov, Georgi S., 4,648,952, Cl. 204-192.120.

Voegeli, Otto: *See*—
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Voisard, Walter B., to Cessna Aircraft Company, The. Controllable pitch aircraft propeller. 4,648,798, Cl. 416-48.000.

Voith Hydro, Inc.: *See*—
Mayo, Howard A., Jr.; and Whippen, Warren G., 4,648,244, Cl. 60-398.000.

Volin, Frank. Wheelchair width adjuster. 4,648,615, Cl. 280-242.0WC.

Von Roll AG: *See*—
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Von Holdt, John W. Mold for manufacturing flanged objects without side action. 4,648,834, Cl. 425-556.000.

von Sprecher, Andreas; Ernest, Ivan; Main, Alan J.; and Beck, Andreas, to Ciba-Geigy Corporation. Aliphatic thioethers. 4,649,215, Cl. 560-152.000.

Voss, Hans W. Adjustable vehicle seat. 4,648,654, Cl. 297-313.000.

Vu, Viet; and Hettwer, Paul F., to Sab Nife Inc. Corrosion resistant mercury-free zinc anode battery. 4,649,093, Cl. 429-229.000.

W. R. Grace & Co.: *See*—
Hwa, Chih M.; and Mitchell, Wayne A., 4,649,025, Cl. 422-15.000.

WABCO Westinghouse Fahrzeugbremsen GmbH: *See*—
Klatt, Alfred; and Reinecke, Erich, 4,648,291, Cl. 74-866.000.
Ulbrich, Gerald; and Neuhaus, Detlev, 4,649,341, Cl. 324-207.000.

Wacker-Chemie GmbH: *See*—
Gerhardinger, Dieter; Wegehaupt, Karl-Heinrich; and Pfeffer, Hans-Rudolf, 4,649,066, Cl. 427-387.000.

Wada, Shunichi; Shimomura, Setsuhiro; Kumagai, Naotake; Takizawa, Shozo; Maruyama, Mitsunori; Tatemoto, Minoru; Takada, Hiroyuki; and Harara, Mitsuhiko, to Mitsubishi Denki Kabushiki Kaisha; and Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Suspension device for automobile. 4,648,622, Cl. 280-707.000.

Waddell, Thomas T. Split bending crown molding. 4,648,225, Cl. 52-288.000.

Wade, Kenneth D.: *See*—
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WaferScale Integration Inc.: *See*—
Eitan, Boaz, 4,649,520, Cl. 365-185,000.

Wagberg, Michael L.: *See*—
Scobie, William B.; and Wagberg, Michael L., 4,648,418, Cl. 137-67.000.

Wagner, Robert J.: *See*—
Slosiarek, Michael L.; and Wagner, Robert J., 4,648,311, Cl. 98-2.110.

Wakamiya, Yoshinori, to Mitsubishi Denki Kabushiki Kaisha. Shape control apparatus for flat material. 4,648,256, Cl. 72-8.000.

Walker, Graham C.: *See*—
Sinskey, Anthony J.; Walker, Graham C.; Higashio, Kanji; Rao, Eswara A.; Shanabruch, William G.; and Yoshihama, Makoto, 4,649,119, Cl. 435-317.000.

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Walker, Robert L.; Crowe, Dale A.; and Lund, Paul D., to Partnership of Robert Walker and Paul Lund. Apparatus for determining the position of a fifth wheel on a multi-axle vehicle. 4,649,369, Cl. 340-52.00R.

Wallace, Theodore C.: *See*—
Scott, Laurie J.; Erickson, Robert E.; and Wallace, Theodore C., 4,649,164, Cl. 521-149.000.

Walter, Ernest J. Removable latch mechanism. 4,648,637, Cl. 292-128.000.

Walter Sarstedt Kunststoff-Spritzgusswerk: *See*—
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Walterdorf, Klaus P.; and Hansson, Volker, to Strabag Bau-AG. Container for the storage of radioactive elements. 4,649,018, Cl. 376-272.000.

Waltke, David L.: *See*—
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Wanser, Karl, to Mannesmann Aktiengesellschaft. Hooded metallurgical vessel. 4,648,584, Cl. 266-158.000.

Wan, Lawrence: *See*—
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Wang, Erik: *See*—
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Wang, Shih-Ping, to Xonics Imaging, Inc. Digital radiography device. 4,649,559, Cl. 378-146.000.

Wanke, Wilhelm; and Hauser, Ludwig, to J.M. Voith GmbH. Paper machine. 4,648,942, Cl. 162-286.000.

Wannenwetsch, Peter, to Robert Bosch GmbH. Pressure valve. 4,648,369, Cl. 123-467.000.

Ward, John W., to Union Oil Company of California. Process for producing a high quality lube oil stock. 4,648,958, Cl. 208-59.000.

Wardle, Ian; and Brattan, Keith, to Imperial Chemical Industries plc. Electrolytic cell. 4,648,953, Cl. 204-237.000.

Ware, Bennie R.: *See*—
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Warner, Donald: *See*—
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Washizu, Hirokazu: *See*—
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Wastechem Corporation: *See*—
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Watanabe, Junji, to Kabushiki Kaisha Toshiba. Picture image forming apparatus. 4,649,437, Cl. 358-286.000.

Watanabe, Kenshu; Uchikawa, Tadashi; Takiyama, Masashi; and Kurahashi, Takashi, to Doryokuro Kakunenryo Kaihatsu Jigyodan. System and method of confirming operation of a steam relieving safety valve for a water-cooled nuclear reactor. 4,648,425, Cl. 137-557.000.

Watanabe, Kenshu; Shiba, Kiminori; Arai, Mikiya; Yamaguchi, Masaya; Fujiki, Yasuo; and Fujimoto, Ryohei, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Condenser microphone having resistance against high-temperature and radioactive rays. 4,648,480, Cl. 181-158.000.

Watanabe, Kiyoshi: *See*—
Uchino, Hayashi; Azuma, Masaaki; Ohashi, Takehisa; and Watanabe, Kiyoshi, 4,649,197, Cl. 544-258.000.

Watanabe, Masaharu: *See*—
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Water Research Centre: *See*—
Abinett, Raymond E., 4,648,746, Cl. 405-184.000.
Watkins, Bruce J.; Regan, Albert M.; Crager, Bruce L.; Fox, Gary L.; and Houlgrave, Robert C., to Hughes Tool Company. Integral buoyant riser. 4,648,747, Cl. 405-195.000.
Watson, Vincent O. Expansion roof. 4,648,217, Cl. 52-90.000.
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Ebenhoch, Sebastian, 4,648,759, Cl. 408-59.000.
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Wegehaupt, Karl-Heinrich: *See*—
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Weiberg, Frederick C., Jr. Fishing line handler. 4,648,197, Cl. 43-25.000.
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Weinstein, David J.: *See*—
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Weiss, Steven M.: *See*—
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Weitzman, Harry L., to Weitzman, Jack J. Air table with selective air distribution. 4,648,779, Cl. 414-676.000.
Weitzman, Jack J.: *See*—
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Weng, Ken K. S.: *See*—
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Wenger, Roger L. L.: *See*—
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Ambrosius, William H., III; and Rossean, Larry D., 4,649,474, Cl. 364-200.000.
Western International, Inc.: *See*—
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Hardin, Roy T., Jr., 4,649,016, Cl. 376-261.000.
Isenberg, Arnold O., 4,648,945, Cl. 204-15.000.
Kennon, Jerry M.; Faulkner, James V., Jr.; and York, Theodore H., 4,649,569, Cl. 455-67.000.
Martin, Matthew; and Ludwig, Richard H., 4,648,488, Cl. 187-126.000.
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Sabol, George P.; McDonald, Samuel G.; and Nurminen, John I., 4,648,912, Cl. 148-11.50F.
Sabol, George P.; and McDonald, Samuel G., III, 4,649,023, Cl. 420-422.000.
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Whaley, Ernest P. Jamb plate for door closer. 4,648,151, Cl. 16-71.000.
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Wickham, David J., to Westinghouse Brake and Signal Co. Electric actuators. 4,649,329, Cl. 318-372.000.
Wicki, Heinz, to Sandoz Ltd. 1:2 metal complexes of a disazo compound having a 5-hydroxy-1-(aminophenyl)pyrazole coupling/diazo component radical and disazo compound having a 1-amino-8-hydroxynaphthalene coupling/diazo component. 4,649,194, Cl. 534-693.000.
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Williams, George J. Stake for a tube bundle. 4,648,442, Cl. 165-162.000.
Williams & Lane Energy Systems Corporation: *See*—
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Williams, Michael R., to Hydrovane Compressor Company Limited, The. Rotary air compressor with thermally responsive oil injection. 4,648,815, Cl. 418-84.000.
Willim, Fritz, to Concast Service Union AG. Method for the continuous casting of metal between two axially parallel cooled cylinders. 4,648,439, Cl. 164-480.000.
Wills, William H. Engine protection apparatus. 4,648,364, Cl. 123-198.00D.
Wilson, Jan S., to American Home Products Corporation. Rabies vaccine. 4,649,049, Cl. 424-89.000.
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Wilson, Robert R., to James Howden & Company Limited. Wind turbines. 4,648,801, Cl. 416-171.000.

Winbow, Graham A.; and Baker, Lawrence J., to Exxon Production Research Co. Method and apparatus for multipole acoustic wave borehole logging. 4,649,526, Cl. 367-35.000.
Wingate, Landry R. Turkey call. 4,648,852, Cl. 446-397.000.
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Wise, Layton A., to Mine Safety Appliances Company. Facemask for abrasive service. 4,648,394, Cl. 128-201.240.
Wise, Thomas W., to Plastech International, Inc. Barrel. 4,648,522, Cl. 220-5.00R.
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Wollar, Burnell, to Phillips Plastics Corporation. Plastic fastener for detachably mounting a panel on a support member. 4,648,766, Cl. 411-41.000.
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Buckley, Thomas F., III; and Wollenberg, Robert H., 4,648,886, Cl. 44-63.000.
Won, Yong K., to Ben Clements & Sons, Inc. Dispenser for bag closures. 4,648,531, Cl. 221-232.000.
Wood, Theodore N., Jr., to Eastern Pennsylvania Co., Inc., The. Safety cap for a pressurized cylinder. 4,648,526, Cl. 220-85.00P.
Woolf, Lawrence D., to GA Technologies Inc. Anemometer having a graphite fiber hot wire. 4,648,271, Cl. 73-204.000.
Worley, Robert F.: *See*—
Mieyal, David F.; Shirey, Richard; and Worley, Robert F., 4,648,230, Cl. 52-667.000.
Worley, William S., Jr., to Hewlett-Packard Company. Operation code selected overflow interrupts. 4,649,478, Cl. 364-200.000.
Worzek, Michael, to Feldkircher Wire Fabricating Co., Inc. Tree protector. 4,648,203, Cl. 47-32.000.
Wray, William R.: *See*—
Kiesel, Kenneth C.; and Wray, William R., 4,649,568, Cl. 382-41.000.
Wright, David L.: *See*—
Carlson, Lee R.; Hegedus, Denes A.; Jarrett, Steven M.; Miller, Michael F.; Riley, Martin E.; and Wright, David L., 4,649,547, Cl. 372-61.000.
Wright, Donald P., Jr.: *See*—
Addor, Roger W.; Wright, Donald P., Jr.; Siddens, Jack K.; and Hand, John J., 4,649,148, Cl. 514-321.000.
Wright, Joe, Jr. Quick release yarn package holder. 4,648,564, Cl. 242-130.000.
Wroblowa, Halina S.: *See*—
Tischer, Ragnar P.; Winterbottom, Walter L.; and Wroblowa, Halina S., 4,649,022, Cl. 419-24.000.
Wupper, Hans: *See*—
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Wurtman, Richard J.; Wurtman, Judith J.; and O'Rourke, Dermot, to Massachusetts Institute of Technology. Method for treating depression with d-fenfluramine. 4,649,161, Cl. 514-654.000.
Wyatt, Wendell L.: *See*—
Mudd, Robert E.; and Wyatt, Wendell L., 4,648,333, Cl. 110-346.000.
Xerox Corporation: *See*—
Sheriff, David R., 4,649,445, Cl. 360-99.000.
Xi, Yao: *See*—
Fang, Chang-Shui; Xi, Yao; Chen, Zhi-Xiong; Bhalla, Amar S.; and Cross, Leslie E., 4,648,991, Cl. 252-1.000.
Xonics Imaging, Inc.: *See*—
Wang, Shih-Ping, 4,649,559, Cl. 378-146.000.
Yabe, Tomoyoshi, to Suminoe Textile Co., Ltd. Apparatus for dyeing a web of fabric continuously. 4,648,250, Cl. 68-5.00D.
Yabuki, Yoshiharu; Sato, Kozo; Kawata, Ken; and Hirai, Hiroyuki, to Fuji Photo Film Co., Ltd. Heat-developable light-sensitive material. 4,649,103, Cl. 430-570.000.
Yagi, Sakai: *See*—
Endo, Takayoshi; Sugiyama, Toshimasa; Murofushi, Satoru; and Yagi, Sakai, 4,648,673, Cl. 339-97.00R.
Yakovlevitch, Daniel; and Rotolico, Anthony J., to Perkin-Elmer Corporation, The. Gas distribution ring for plasma gun. 4,649,257, Cl. 219-121.0PP.
Yamada, Fujio. Hot nozzle for runnerless mold. 4,648,833, Cl. 425-549.000.
Yamada, Mitsuhiko; and Kitamura, Hideaki, to Dainippon Screen Mfg. Co., Ltd. Collection method of data on feed amount of printing ink and system therefor. 4,649,500, Cl. 364-518.000.
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Yamada, Tadatoshi: *See*—
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Yamada, Yoshio; and Nakasone, Hidetaka, to Ishikawa Gasket Co. Ltd. Steel laminate gasket with assembly order identification device. 4,648,607, Cl. 277-235.00B.
Yamaguchi, Hiroshi; Tanaka, Teruaki; Hirai, Masatake; Kohketsu, Tadashi; Matsumoto, Masahiro; and Kawate, Kenji, to Allied Corporation. Annealing furnace for annealing magnetic cores in a magnetic field. 4,649,248, Cl. 219-10.570.
Yamaguchi, Masaya: *See*—
Watanabe, Kenshu; Shiba, Kiminori; Arai, Mikiya; Yamaguchi, Masaya; Fujiki, Yasuo; and Fujimoto, Ryohei, 4,648,480, Cl. 181-158.000.
Yamaguchi, Nobu: *See*—
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Yamaguchi, Nobutaka: *See*—
Ryoke, Katsumi; Yamaguchi, Nobutaka; Takahashi, Masatoshi; Hanai, Kazuko; Kosha, Hideaki; and Tadokoro, Eiichi, 4,649,072, Cl. 428-212.000.
Yamaguchi, Yoshio: *See*—
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Yamaji, Koji: *See*—
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Yamamoto, Akinori; and Kurii, Masaaki, to Nippondenso Co., Ltd. Motor driven extensible rod antenna for vehicles with position control circuit. 4,649,398, Cl. 343-903.000.
Yamamoto, Akira: *See*—
Takamizawa, Minoru; Yamamoto, Akira; Ishihara, Toshinobu; and Nagura, Shigehiro, 4,649,185, Cl. 526-279.000.
Yamamoto, Hiroyuki: *See*—
Kimura, Toshio; Nakagawa, Shuichi; Tokumo, Teruhiko; Yamamoto, Hiroyuki; Kotan, Hiroshi; Otsu, Hiroshi; and Satoh, Tetsuya, 4,649,399, Cl. 346-32.000.
Yamamoto, Makoto, to Mitsubishi Denki Kabushiki Kaisha. Pulse generating circuit. 4,649,290, Cl. 307-260.000.
Yamamoto, Minoru: *See*—
Tajima, Ichiro; and Yamamoto, Minoru, 4,649,071, Cl. 428-212.000.
Yamamoto, Osamu; and Yamada, Muneki, to Toyo Seikan Kaisha, Limited. Method of making a plastic cap. 4,649,013, Cl. 264-318.000.
Yamanaka, Hideaki: *See*—
Takaya, Takao; Takasugi, Hisashi; and Yamanaka, Hideaki, 4,649,136, Cl. 514-202.000.
Yamanouchi, Roy K., to National Semiconductor Corporation. Strobe line driver circuit. 4,649,299, Cl. 307-480.000.
Yamaoka Industry Corporation: *See*—
Nishikawa, Eikichi, 4,648,378, Cl. 126-21.00A.
Yamashita, Hiroshi: *See*—
Sumi, Naoki; Yamashita, Hiroshi; and Sekizuka, Yasuo, 4,649,052, Cl. 426-49.000.
Yamashita, Tatsumaro, to Alps Electric Co., Ltd. Direct drive motor having adjustable bearing for spindle. 4,649,306, Cl. 310-90.000.
Yamatake-Honeywell Co. Ltd.: *See*—
Doki, Yoshikuni; Fujiwara, Masatoshi; Shiga, Tatsuhide; Shono, Yohsuke; Tanaka, Mikio; and Tsuruoka, Yoshihiro, 4,649,359, Cl. 335-222.000.
Yamauchi, Junichi: *See*—
Omura, Ikuo; Higaki, Tatsuhiko; and Yamauchi, Junichi, 4,648,844, Cl. 433-217.100.
Yamauchi, Takayoshi; Hattori, Kaneaki; Ikeda, Shun-ichi; Nakao, Kenji; and Tamaki, Kentaro, to Kyowa Hakko Kogyo Co. Ltd. Process for producing an α-aromatic group substituted alkanoic acid derivative. 4,649,213, Cl. 560-56.000.
Yamazaki, Hiroshi: *See*—
Ogihara, Masuo; Oda, Hajime; Seki, Yoichi; and Yamazaki, Hiroshi, 4,648,701, Cl. 354-439.000.
Yanagihashi, Kikuji: *See*—
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Yanase, Yukimasa; and Okada, Tsuneyoshi, to Polyplastics Co., Ltd. Polyacetal resin composition. 4,649,172, Cl. 524-413.000.
Yang, Tai-Her. Vise structure having articulatable vise jaws. 4,648,585, Cl. 269-104.000.
Yankee Noodle Dandy, Inc.: *See*—
Cardullo, Mario; Caraluzzi, Mark; and Schildbach, Peter, 4,649,056, Cl. 426-509.000.
Yardley, Alfred, to Lucas Industries Public Limited Company. Hydraulic anti-skid braking systems for vehicles. 4,648,664, Cl. 303-115.000.
Yarnell, Ian R. Robot. 4,648,454, Cl. 166-297.000.
Yashima, Tsuneaki, to Kawasaki Yucoh Co., Ltd. Press equipment with supporting and levelling apparatus for producing molding compound parts by compression. 4,648,823, Cl. 425-150.000.

Yasuda, Takeshi: *See*—
Naruki, Yukio; and Yasuda, Takeshi, 4,649,400, Cl. 346-76.0PH.
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Yasukawa, Hiroshi, to Niigata Engineering Co., Ltd. Magazine for replaceable tools and operation method of indexing tools using the magazine. 4,648,171, Cl. 29-568.000.
Yater, Jerry L., to Force Control Industries, Inc. Clutch-brake unit with improved oil pump impellers. 4,648,494, Cl. 192-18.00A.
Yazaki Corporation: *See*—
Endo, Takayoshi; Sugiyama, Toshimasa; Murofushi, Satoru; and Yagi, Sakai, 4,648,673, Cl. 339-97.00R.
Yazawa, Satoru: *See*—
Oguchi, Koichi; Hosokawa, Minoru; Yazawa, Satoru; and Nagata, Mitsuo, 4,648,691, Cl. 350-338.000.
Yeda Research and Development Company Ltd.: *See*—
Shanzer, Abraham; and Samuel, David, 4,649,218, Cl. 564-197.000.
Yeh, Chuen Y.; and Savini, Charles, to Exxon Research & Engineering Co. Catalysts and process for the conversion of olefins to ketones. 4,649,223, Cl. 568-403.000.
Yeung, Hong-Ning; Kao, Chiiming; and Lent, Arnold H., to Technicare Corporation. Complex quotient nuclear magnetic resonance imaging. 4,649,346, Cl. 324-309.000.
Yoda, Kiyoshi; Itagaki, Hidenobu; Fujimura, Satoshi; and Yamada, Tadatoshi, to Mitsubishi Denki Kabushiki Kaisha. NMR imaging method. 4,649,345, Cl. 324-309.000.
Yohe, Warren C.: *See*—
Hale, Thomas E.; and Yohe, Warren C., 4,649,084, Cl. 428-552.000.
Yokogawa Hokushin Electric Corporation: *See*—
Kimura, Toshio; Nakagawa, Shuichi; Tokumo, Teruhiko; Yamamoto, Hiroyuki; Kotan, Hiroshi; Otsu, Hiroshi; and Satoh, Tetsuya, 4,649,399, Cl. 346-32.000.
Yokoi, Tatsuhisa: *See*—
Noguchi, Yoshikazu; Yokoi, Tatsuhisa; Takeya, Eisaku; and Osawa, Hideyuki, 4,648,373, Cl. 123-568.000.
Yokoya, Yuji; Buma, Shuuichi; Araki, Hitoshi; Miyata, Hiroshi; Hirose, Masanori; and Ohashi, Kaoru, to Toyota Jidosha Kabushiki Kaisha. Method of adjusting vehicle height. 4,648,621, Cl. 280-707.000.
Yokoyama, Shigeki: *See*—
Mukunoki, Yasuo; Yokoyama, Shigeki; Kawasaki, Hiroshi; Nemori, Ryoichi; and Takeuchi, Tetsuo, 4,649,102, Cl. 430-527.000.
York, Theodore H.: *See*—
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Yoshida, Akio: *See*—
Tsubai, Yasuo; Okazaki, Koji; Horii, Shoichi; and Yoshida, Akio, 4,649,096, Cl. 430-249.000.
Yoshida, Masanobu: *See*—
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Yoshida, Susumu: *See*—
Mitsui, Kotaro; Kato, Mari; Oda, Takao; and Yoshida, Susumu, 4,649,088, Cl. 428-697.000.
Yoshida, Taizo; Mori, Masaaki; Koyama, Jiro; and Haruna, Masamitsu, to Ricoh Company, Ltd. Optical switching device. 4,648,687, Cl. 350-96.130.
Yoshihama, Makoto: *See*—
Sinskey, Anthony J.; Walker, Graham C.; Higashio, Kanji; Rao, Eswara A.; Shanabruch, William G.; and Yoshihama, Makoto, 4,649,119, Cl. 435-317.000.
Yoshikawa, Norio, to Omron Tateisi Electronics Co. Heating cylinder device for a molding machine. 4,649,262, Cl. 219-421.000.
Yoshikawa, Toshiharu; and Shibata, Takanori, to Toyo Contact Lens Co., Ltd. Oxygen permeable soft contact lens material. 4,649,184, Cl. 526-279.000.
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for the treatment of pains or pyrexia due to the accentuation of central nerve. 4,649,133, Cl. 514-42.000.
Yoshioka, Ikuo. Robot hand for stacking boxes. 4,648,771, Cl. 414-71.000.
Yoshiwara, Kazuhisa: *See*—
Kodama, Takuma; Takahashi, Kenji; Ishibashi, Shizuka; Kudo, Koji; Masuda, Yukihiro; Hombough, Masanori; Miyoshi, Osamu; and Yoshiwara, Kazuhisa, 4,649,421, Cl. 358-51.000.
Young, James: *See*—
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Young, John W.; Luke, Roger D.; Rhodes, Henry J.; and Hudgins, Jeffrey K., to Siemens-Allis, Inc. Solenoid actuated high speed, high current making switch with a movable contact ring. 4,649,241, Cl. 200-82.00R.
Young, Michael J. R., to General Dispensing Systems Limited. Transport system for material in powder or like form. 4,648,557, Cl. 239-102.200.
Yuan, James J. Nail clipper and retainer and disposer of nail clippings. 4,648,415, Cl. 132-73.000.
Yuji, Kawahara: *See*—
Sadamitsu, Nishihara; and Yuji, Kawahara, 4,648,718, Cl. 356-387.000.
Yukawa, Kazuhiko, to Matsushita Electric Works, Ltd. Electronic pedometer with step sensor in removable insole. 4,649,552, Cl. 377-24.000.
Yusa, Hideo: *See*—
Uetake, Naohito; Kawamura, Fumio; Yusa, Hideo; Kikuchi, Makoto; and Tamata, Shin, 4,648,990, Cl. 252-628.000.
Zabler, Erich, to Robert Bosch GmbH. Magnetic differential position sensor. 4,649,340, Cl. 324-207.000.
Zach, Reuven D.: *See*—
Nelson, Robert S.; and Zach, Reuven D., 4,649,275, Cl. 250-358.100.
Zachary, Richard E., to Dow Chemical Company, The. Sight tube assembly and sensing instrument for controlling a gas turbine. 4,648,711, Cl. 356-44.000.
Zambri, Patrick M.: *See*—
Marsh, Gary B.; Fanelli, Anthony J.; Armor, John N.; and Zambri, Patrick M., 4,649,037, Cl. 423-338.000.
Zato, Thomas J.: *See*—
Jones, Gary A.; Rees, Raymond M.; and Zato, Thomas J., 4,649,428, Cl. 358-188.000.
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Fischer, Juergen; Zeiner, Hartmut; Nissen, Dietmar; Heinz, Gerhard; and Neumann, Peter, 4,649,080, Cl. 428-419.000.
Zemanek, Joseph, Jr.: *See*—
Angona, Frank A.; and Zemanek, Joseph, Jr., 4,649,525, Cl. 367-31.000.
Zenbayashi, Michio; and Sato, Noria, to Toshiba Silicone Co., Ltd. Process for making amino group-containing organosilicon compounds. 4,649,208, Cl. 556-413.000.
Zenith Electronics Corporation: *See*—
Jones, Gary A.; Rees, Raymond M.; and Zato, Thomas J., 4,649,428, Cl. 358-188.000.
Kelly, Gordon E.; Krishnamurthy, Gopalan; and Rypkema, Jouke N., 4,649,420, Cl. 358-38.000.
Zeugner, Horst; Romer, Dietmar; Liepmann, Hans; and Milkowski, Wolfgang, to Kali-Chemie Pharma GmbH. 2-acylaminomethyl-1,4-benzodiazepine compounds, the preparation thereof, and pharmaceutical compositions containing them. 4,649,137, Cl. 514-221.000.
Ziecina, Frederick J.: *See*—
Hammer, William E.; Schwane, Walter H.; and Ziecina, Frederick J., 4,649,473, Cl. 364-200.000.
Ziegenfus, Barry L.: *See*—
Gutekunst, Stanley K.; Scheel, Russell H.; and Ziegenfus, Barry L., 4,648,325, Cl. 104-166.000.
Zielinski, Erich, to Rheinmetall GmbH. Counter recoil mechanism, preferably for an artillery weapon. 4,648,306, Cl. 89-43.020.
Zimmerman, Theodore S.; and Fulcher, Carol A., to Scripps Clinic and Research Foundation. Treatment of Factor VIII inhibitors. 4,649,132, Cl. 514-12.000.
Zimmermann, Anzo, to Rotpunkt Dr. Anso Zimmermann. Insulating jug of which the opening is closable by a closure member. 4,648,535, Cl. 222-472.000.
Zimmermann, Egbert; and Nutzel, Oswald. Support for a tension tie member, such as a diagonal cable in a stayed girder bridge. 4,648,147, Cl. 14-21.000.
Zimmermann, Egbert: *See*—
Nutzel, Oswald; and Zimmermann, Egbert, 4,648,146, Cl. 14-21.000.
Zimser, Richard L., Jr.; Silverstein, Seth D.; and Koch, Steven R., to General Electric Company. Two-input crosstalk-resistant adaptive noise canceller. 4,649,505, Cl. 379-411.000.
Zipp, Adam: *See*—
Ismail, Ibrahim A.; Hemmes, Paul; Skarstedt, Mark T.; and Zipp, Adam, 4,649,121, Cl. 436-14.000.
Zollinger, Hans R., to H. A. Schlatter AG. Apparatus for butt welding automotive wheel rim blanks. 4,649,253, Cl. 219-101.000.
Zornes, David A.: *See*—
Bruch, George H., 4,648,630, Cl. 285-87.000.
Zuckerman, Matthew M., to Mark Telephone Products, Inc. Helium detector. 4,648,260, Cl. 73-23.100.
Zurn, Karl, to Optima-Maschinenfabrik Dr. Buhler GmbH & Co. Device for welding foils having different thickness along a weld line. 4,649,259, Cl. 219-243.000.
Zychowski, Edwin A.: *See*—
Gaske, Joseph E.; and Zychowski, Edwin A., 4,649,045, Cl. 424-61.000.
501 Hollingsworth (U.K.) Ltd.: *See*—
Smith, Alan; and Patel, Bhupendra, 4,648,502, Cl. 198-399.000.
501 Trans World Connections Ltd.: *See*—
Tubbs, Joseph T., 4,648,682, Cl. 339-154.00A.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF MARCH, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AMP Incorporated: *See*—
Bright, Edward J.; and Kandybowski, Steven J., Re. 32,370, Cl. 339-17.0CF.

Ball Corporation: *See*—
Stockton, Ronald J.; and Munson, Robert E., Re. 32,369, Cl. 342-368.000.

Bowman, Peter; and Frieze, Allan S., to Warner Lambert Company. Disposable razor with sliding cap. Re. 32,367, Cl. 30-47.000.

Bright, Edward J.; and Kandybowski, Steven J., to AMP Incorporated. Low height ADS connector. Re. 32,370, Cl. 339-17.0CF.

Frieze, Allan S.: *See*—
Bowman, Peter; and Frieze, Allan S., Re. 32,367, Cl. 30-47.000.

Funatsu, Chuhei; and Hirata, Toshikiyo, to Toyo Tsushinki K.K. Collision avoidance system for aircraft. Re. 32,368, Cl. 342-45.000.

Hirata, Toshikiyo: *See*—
Funatsu, Chuhei; and Hirata, Toshikiyo, Re. 32,368, Cl. 342-45.000.

Kandybowski, Steven J.: *See*—
Bright, Edward J.; and Kandybowski, Steven J., Re. 32,370, Cl. 339-17.0CF.

Munson, Robert E.: *See*—
Stockton, Ronald J.; and Munson, Robert E., Re. 32,369, Cl. 342-368.000.

Stockton, Ronald J.; and Munson, Robert E., to Ball Corporation. Monolithic microwave integrated circuit with integral array antenna. Re. 32,369, Cl. 342-368.000.

Toyo Tsushinki K.K.: *See*—
Funatsu, Chuhei; and Hirata, Toshikiyo, Re. 32,368, Cl. 342-45.000.

Warner Lambert Company: *See*—
Bowman, Peter; and Frieze, Allan S., Re. 32,367, Cl. 30-47.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Alia, Dominic. Processible and vulcanizable polar polymers. B1 4,180,531, 3-10-87, Cl. 525-214.000.

Allied Corp., The: *See*—
Rhee, Seong K.; and Kwolek, John P., B1 3,835,118, Cl. 523-155.000.

Anderson, Gordon K.; Evans, Richard A.; and Hilmer, Ralph H., to Lear Siegler, Inc. Apparatus for connecting a stationary air conditioning unit to aircraft. B1 3,399,545, 3-10-87, Cl. 62-237.000.

Aschwanden, Werner; and Kyburz, Emilio, to Hoffmann-La Roche Inc. 1-pyrrolidine acetamides. B1 4,476,308, 3-10-87, Cl. 546-208.000.

Bartlett, Robert W.; and Jorgensen, Paul J., to S R I International. Process for applying thermal barrier coatings to metals. B1 4,483,720, 3-10-87, Cl. 148-6.300.

Chemische Werke Albert Aktiengesellschift: *See*—
Mohler, Werner; Reiser, Mario; and Popendiker, Kurt, B1 3,737,433, Cl. 544-271.000.

Duz-Mor, Inc.: *See*—
Field, Carl R., B1 4,574,614, Cl. 72-447.000.

Evans, Richard A.: *See*—
Anderson, Gordon K.; Evans, Richard A.; and Hilmer, Ralph H., B1 3,399,545, Cl. 62-237.000.

Field, Carl R., to Duz-Mor, Inc. Apparatus for repairing and straightening vehicles. B1 4,574,614, 3-10-87, Cl. 72-447.000.

Hilmer, Ralph H.: *See*—
Anderson, Gordon K.; Evans, Richard A.; and Hilmer, Ralph H., B1 3,399,545, Cl. 62-237.000.

Hoffmann-La Roche Inc.: *See*—
Aschwanden, Werner; and Kyburz, Emilio, B1 4,476,308, Cl. 546-208.000.

Imada, Isuke: *See*—
Morimoto, Hiroshi; Imada, Isuke; Watanabe, Masazumi; and Kawada, Mitsuru, B1 4,407,757, Cl. 260-413.000.

Jorgensen, Paul J.: *See*—
Bartlett, Robert W.; and Jorgensen, Paul J., B1 4,483,720, Cl. 148-6.300.

Kawada, Mitsuru: *See*—
Morimoto, Hiroshi; Imada, Isuke; Watanabe, Masazumi; and Kawada, Mitsuru, B1 4,407,757, Cl. 260-413.000.

Kwolek, John P.: *See*—
Rhee, Seong K.; and Kwolek, John P., B1 3,835,118, Cl. 523-155.000.

Kyburz, Emilio: *See*—
Aschwanden, Werner; and Kyburz, Emilio, B1 4,476,308, Cl. 546-208.000.

Lanier Business Products, Inc.: *See*—
Plunkett, Luther C., Jr., B1 4,500,753, Cl. 179-6.030.

Lear Siegler, Inc.: *See*—
Anderson, Gordon K.; Evans, Richard A.; and Hilmer, Ralph H., B1 3,399,545, Cl. 62-237.000.

Matsumoto, Hiroyaki, to Tsukasa Kasei Kogyo Kabushiki Kaisha. Polypropylene strap and method of manufacturing the same. B1 4,503,007, 3-10-87, Cl. 264-210.700.

Mirowski, Mieczyslaw. Standby defibrillator and method of operation. B1 1,027,757, 3-10-87, Cl. 128-419.00D.

Mohler, Werner; Reiter, Mario; and Popendiker, Kurt, to Chemische Werke Albert Aktiengesellschift. Certain oxoalkyldimethylxanthines. B1 3,737,433, 3-10-87, Cl. 544-271.000.

Morimoto, Hiroshi; Imada, Isuke; Watanabe, Masazumi; and Kawada, Mitsuru, to Takeda Chemical Industries, Ltd. Aralkyl carboxylic acid compounds. B1 4,407,757, 3-10-87, Cl. 260-413.000.

Plunkett, Luther C., Jr., to Lanier Business Products, Inc. Telephone answering apparatus with recorded time of day and date. B1 4,500,753, 3-10-87, Cl. 179-6.030.

Popendiker, Kurt: *See*—
Mohler, Werner; Reiser, Mario; and Popendiker, Kurt, B1 3,737,433, Cl. 544-271.000.

Reiser, Mario: *See*—
Mohler, Werner; Reiser, Mario; and Popendiker, Kurt, B1 3,737,433, Cl. 544-271.000.

Rhee, Seong K.; and Kwolek, John P., to Allied Corp., The. Sponge iron friction material. B1 3,835,118, 3-10-87, Cl. 523-155.000.

S R I International: *See*—
Bartlett, Robert W.; and Jorgensen, Paul J., B1 4,483,720, Cl. 148-6.300.

Takeda Chemical Industries, Ltd.: *See*—
Morimoto, Hiroshi; Imada, Isuke; Watanabe, Masazumi; and Kawada, Mitsuru, B1 4,407,757, Cl. 260-413.000.

Tsukasa Kasei Kogyo Kabushiki Kaisha: *See*—
Matsumoto, Hiroyaki, B1 4,503,007, Cl. 264-210.700.

Watanabe, Masazumi: *See*—
Morimoto, Hiroshi; Imada, Isuke; Watanabe, Masazumi; and Kawada, Mitsuru, B1 4,407,757, Cl. 260-413.000.

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NOTE.—First number, class; second number, subclass; third number, patent number

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CLASS 294

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CLASS 297

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440 4,648,658

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317 4,649,119

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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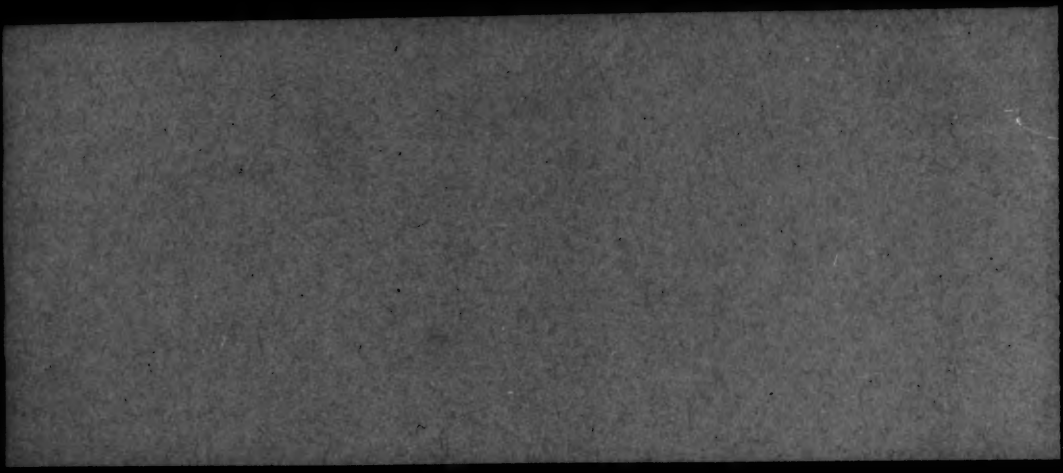

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